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THE ABSORPTION OF DRUGS AND POISONS THROUGH THE SKIN AND MUCOUS MEMBRANES

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BALTIMORE

The importance of absorption of drugs and poisons through the skin and mucous membranes needs no emphasis. This subject is of vital interest not only to medical men but to all biologists concerned with that borderline science known as pharmacology, which has to do with the relationship of the physicochemical sciences, on the one hand, and the biologic, on the other. It is also of great practical significance, particularly to dermatologists and other medical specialists who prescribe drugs and chemicals for application to skin or mucous membranes.

I have taken a lively interest in experimental investigations on absorption of drugs and poisons for more than twenty years. Indeed, in 1910 I recorded a research on lavage in the treatment of acute phenol poisoning in which the absorption of phenol through both the skin and the mucosa of the stomach and the intestines was experimentally studied. This research led to some practical conclusions in regard to treatment.[1] Soon afterward, in a series of publications dealing with absorption of drugs through unusual channels, I demonstrated by experimental methods, physical and chemical, much to the consternation of the practical clinician, that many medicinal substances were often absorbed through previously unsuspected regions of skin and mucous membrane. Thus I[2] reported in THE JOURNAL a novel demonstration by which it was proved that morphine and apomorphine, absorbed through the eye without passing down the nasal ducts, produced typical emetic effects. Later I[3] demonstrated that the same alkaloids are readily absorbed also through all kinds of mucous membranes, e. g., those of the nose, urethra and vagina, bladder and ureter, and even through the skin of the prepuce. Further experiments[4] showed that all sorts of chemicals such as salts, alkaloids and antiseptics, are readily absorbed through the genito-urinary tract and particularly through the vagina.[4] Observations of such general interest justified the publication of editorials on the subject in THE JOURNAL.[5] Ten years later an additional report[6] exposed the fallacy of claims made for the innocuousness of various contraceptives and proved that they are readily absorbed through the vaginal walls and produce systemic reactions. Still other studies[7] demonstrated that drugs and poisons can be absorbed through the mucosa of the esophagus, through sockets of teeth and through the intact ear drum, a phase of the subject of interest in connection with Shakespeare's "Hamlet." A remarkable exception to the general rule was noted in connection with the urinary bladder. While the urethra is freely permeable to all kinds of drugs, the mucous membranes of the bladder are impenetrable by nearly all the chemicals studied.

In the present paper are reported the results of five years' studies on absorption of drugs through normal skin and mucosa, on the one hand, and pathologic tissues, on the other. A discussion of the clinical data accumulated will be published elsewhere, but even a mere exposition of the research will suggest new therapeutic possibilities to the alert practitioner.

ABSORPTION OF CHEMICALS APPLIED IN THEIR NATURAL STATE OR IN AQUEOUS SOLUTION

It is common knowledge that a number of drugs or chemicals, when applied to the conjunctiva and other mucous membranes and even to the integument or epidermis, are absorbed into the system and produce toxicologic reactions. Handbooks on toxicology and legal medicine furnish abundant evidence of such poisoning. Thus, for instance, many a case of poisoning by arsenic or other chemicals incorporated in cosmetics has resulted from application to the scalp. Arsenic under certain conditions can be absorbed through other regions of the skin. A striking case of fatal poisoning caused by the absorption of arsenic solution spilled over the feet of a stevedore who broke a glass carboy containing it has been described.[8] All physicians know that the blue ointment (metallic mercury in finely dispersed form in fat) employed as an antisyphilitic agent is readily absorbed through the skin. Signs of partial or superficial penetration of the skin have been noted after prolonged local application of cyanides and of the very poisonous alkaloid aconitine.

Read before the Section on Dermatology and Syphilology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.

1. Macht, D. I.: An Experimental Study of Lavage in Acute Carbolic Acid Poisoning, Bull. Johns Hopkins Hosp. **26**: 98, 1915.
2. Macht, D. I.: The Absorption of Apomorphine and Morphine Through the Conjunctiva, J. A. M. A. **68**: 1230 (April 28) 1917.
3. Macht, D. I.: On the Absorption of Apomorphine and Morphine through Unusual Channels, Proc. Soc. Exper. Biol. & Med. **15**: 26, 1917.
4. Macht, D. I.: On the Absorption of Drugs and Poisons from the Bladder and the Urethra: I. Absorption of Apomorphin and Morphin, J. Urol. **2**: 43 (Feb.) 1918; II. Absorption of Various Alkaloids, Antiseptics, Local Anesthetics and Salts, ibid. **2**: 211 (June) 1918; Concerning the Absorption of Drugs and Poisons from the Ureter and Pelvis of the Kidney, ibid. **2**: 481 (Dec.) 1918; On the Absorption of Drugs and Poisons through the Vagina, J. Pharmacol. & Exper. Therap. **10**: 509 (Jan.) 1918.
5. Absorption through Unusual Surfaces, Current Comment, J. A. M. A. **70**: 1232 (April 27) 1918. The Absorption of Drugs through Unusual Channels, editorial, ibid. **81**: 1954 (Dec. 8) 1923.
6. Macht, D. I.: Concerning the Absorption of Quinin and Oxyquinolin Sulphate through the Vagina, J. Pharmacol. & Exper. Therap. **34**: 137 (Oct.) 1928.
7. Macht, D. I.: Absorption of Drugs through the Eye, Ear, Teeth and Esophagus, J. Pharmacol. & Exper. Therap. **22**: 123 (Sept.) 1923; A Pharmacological Appreciation of Shakespeare's Hamlet: On Instillation of Poisons into the Ear, Bull. Johns Hopkins Hosp. **29**: 165 (July) 1918.
8. Macht, D. I.: Arsensäure-Vergiftung, gewerbliche, durch die Haut, Samml. v. Vergiftungsfällen **1**: 103, 1930.

Lead poisoning is too well known to be discussed here, and gangrene resulting from phenol dressings is still vividly depicted in certain textbooks on therapeutics. Even the opium alkaloids penetrate the epidermis deeply enough to affect the superficial sensory nerve endings, as Macht, Johnson and Bollinger [9] demonstrated in 1919. R. V. Rice and I, in studies on the comparative pharmacology of tribromethanol and certain homologues, recently found that these compounds are readily absorbed through the skin of mice.[9a] In most cases, however, drugs applied directly in either natural state or aqueous solution to the skin are not absorbed into the circulating blood. Dermatologists and other practitioners accordingly have employed most frequently medicaments incorporated either in lotions or in ointments to facilitate their penetration of deeper layers of the integument. With this in mind, I began an experimental inquiry into the relative efficacy of various ointment bases employed in this manner.

PENETRATION OF FIXED OILS AND FATS

In 1932-1933 I made a series of studies on the relative penetration by different fats and oils of the skin of various animals, particularly rabbits and guinea pigs. Several active drugs, the absorption of which I attempted to follow by either pharmacologic or biochemical reactions, were incorporated in ointment bases. Osmic acid, employed in purely histologic or anatomic methods, proved to be unsuitable for detecting penetrability of fats through the integument, since it is practically impossible to cut sections without dragging or pushing some of the fat into the deeper layers. Accordingly ointments were made of petrolatum, lard, hydrous wool fat, a synthetic proprietary preparation of cholesterol, goose fat, bear fat and greaseless cream, and lotions were prepared with olive oil, cottonseed oil, lard oil, mineral oil (liquid petrolatum) and peach kernel oil. The penetration of several potent drugs incorporated in these bases or vehicles was studied pharmacologically.

TABLE 1.—*Toxicity of 1 Cc. Doses of Essential Oils When Applied to the Skin of White Mice*

Oil	Initial Effect of Absorption	Final Effect of Absorption
Cinnamon	Unconscious in 10 min.	Died in 1 hr., 25 min.
Cloves	Unconscious in 20 min.	Died in 2 hr., 20 min.
Wintergreen	Unconscious in 1 hr.	Recovered
Wintergreen, 2 cc.	Unconscious in 1 hr.	Died in 1 hr., 15 min.
Fennel	Unconscious in 1½ hr.	Died in 6 hr., 30 min.
Betula	Unconscious in 1¾ hr.	Died in 2 hr.
Lemon	Unconscious in 1 hr.	Died in 4½ hr.
Orange	Unconscious in 30 min.	Died in 5½ hr.
Anise	Unconscious in 24 min.	Died in 2½ hr.
Peppermint	Unconscious in 12 min.	Died in 1 hr.
Thyme	Unconscious in 22 min.	Died in 1 hr.
Sassafras	Unconscious in 33 min.	Died in 1½ hr.
Rose geranium	Unconscious in 22 min.	Died in 1¾ hr.

Thus ointments made with various bases—1 per cent iodine, 5 per cent phenol, 0.1 per cent strychnine, 1 per cent mercury bichloride, thallium salts, and a complicated synthetic organic sulfur compound, 5 per cent tetramethylthiuram monosulfide—were applied to the shaven skin of rabbits and guinea pigs. The treated areas were then covered with oil paper, bandage and adhesive tape to ensure long-lasting contact of the ointment with the skin, on the one hand, and to preclude its ingestion by licking, on the other. Fresh applications were made at various intervals thereafter, and the animals were watched for pharmacologic or biochemical signs of absorption of the active drugs.

Absorption through the skin of iodine incorporated in an ointment was proved by its excretion in the urine. Apparently, however, the ointment form of the drug penetrated the skin no better than the liquid; indeed, it seemed in some cases that iodine incorporated in ointment bases penetrated more slowly than the official tincture painted on the intact skin. A special technic is employed to detect excretion of iodine in the urine. Even inorganic iodine (e. g., tincture of iodine) when absorbed into the body is excreted not in ionic or inorganic form but in combination with organic compounds which must be disrupted by oxidizing agents to set the iodine free before the ordinary tests, such as that with starch, can be effected.

Absorption of mercury bichloride in ointment form was determined by testing the urine for mercury and noting resultant nephritis and death of the animal. Absorption of strychnine incorporated in ointments was demonstrated by heightened excitability of the spinal cord, followed by convulsions and death.

Such experimentation revealed that none of the fixed fats carrying potent drugs were absorbed very readily, and signs of poisoning supervened in some cases only after repeated application of the ointments for several days. Hydrous wool fat was more efficient than the other fats, but on the whole the results obtained in studies with drugs incorporated in fats as well as in olive oil, linseed oil and liquid petrolatum were disappointing. All the fixed oils and fats penetrated the normal epidermis to but a slight extent; in fact, some drugs incorporated therein were absorbed less readily than when applied in aqueous or hydroalcoholic solution.

These observations do not intimate that fixed fats and oils are useless in dermatologic therapy. Their chief value in therapeutics, however, lies in their emollient and protective action and their function as fixatives which ensure long-lasting contact of other chemicals incorporated in them with the surface to which they are applied.

ABSORPTION OF ESSENTIAL OILS

After these experiments with fixed or heavy oils and fats had been completed, a new approach to the problem of selecting vehicles for conveyance of various drugs through the skin was suggested by certain medico-historical considerations. It is well known that the ancients effectively treated wounds with balsams and resins and preserved mummies by embalming the bodies with similar aromatic solutions. In both instances extensive use was made of vegetable materials, obviously efficient as antiseptics and preservatives by reason of their penetration of the superficial layers of body tissue and their permeation of those which lie deeper. The chief constituents of such balsams and resins are the so-called essential or volatile oils. It was therefore deemed worth while to inquire into the penetrative power of a series of essential, volatile or aromatic oils. The pharmacology of these oils, still widely employed as perfuming and flavoring agents (with the exception of methyl salicylate, or oil of wintergreen,[10] and possibly oil of cloves), is practically unexplored. I have examined the following volatile oils: anise, asarum, bergamot, betula, caraway, cardamom, cassia, chamo-

9. Macht, D. I.; Johnson, S. L., and Bollinger, H. J.: On the Peripheral Action of the Opium Alkaloids: Effect on the Sensory Nerve Terminals, J. Pharmacol. & Exper. Therap. **8**: 451 (Aug.) 1916.

9a. Rice, R. V., and Macht, D. I.: Nature, London **140**: 849, 1937.

10. Brown, E. W., and Scott, W. O.: Absorption of Methyl Salicylate by Human Skin, J. Pharmacol. & Exper. Therap. **50**: 32 (Jan.) 1934; Comparative Absorption of Certain Salicylate Esters by Human Skin, ibid. **50**: 373 (April) 1934.

mile, cinnamon, citronella, cloves, coriander, eucalyptus, fennel, jasmine, juniper, kananga, lavender, lemon, marjoram, neroli, nutmeg, orange, pennyroyal, peppermint, rose geranium, rue, sassafras, spearmint, tansy, thyme, wintergreen.

I applied small quantities of various volatile oils directly either to the fur of mice, rats and guinea pigs or to the shaven skin of rats, guinea pigs, rabbits, cats and dogs, and unmistakable signs of absorption of all the essential oils were thus obtained. The smaller animals are especially useful for demonstrating this phenomenon. Some of the volatile oils effected a primary excitation followed by depression, coma and death; others produced immediate depression and still others convulsions. In all cases a sufficiently large dose (1 cc. or more) applied to mice or rats was fatal. These toxic symptoms were due neither to ingestion nor to inhalation of the oils, as control experiments definitely indicated. Table 1 shows the effect of application to mice of 1 cc. of respective essential oils. Smaller quantities of these oils produced definite pharmacologic reactions but not death.

These observations are of great interest from both the pharmacologic and the therapeutic points of view because they beautifully corroborate the experiences of the ancients, who employed preservative oils, spices and balsams for embalming, and because these oils have recently been proved to possess antiseptic properties.[11]

The clinical practitioner should not conclude, however, that such oils may be employed medicinally without further inquiry as to their dangers. Nearly all of them when given in sufficient quantity are grave poisons effecting fatty and parenchymatous degeneration of the kidneys and injuring the central nervous system. Thus, during the World War an attempt was made to employ some of these oils and their derivatives as delousing agents. They killed the hosts as well as the parasites. Too much emphasis cannot be laid on the profound dictum of modern pharmacology that every drug is a poison and that every poison may be a drug. No chemical should be used medicinally until extensive pharmacologic study has determined its margin of safety or so-called therapeutic index.

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ESSENTIAL OILS AS VEHICLES

Having demonstrated that most of the essential oils, applied in sufficient quantity, are readily absorbed through the skin, I employed some of them as vehicles or solvents for other active drugs. Thus strychnine, dissolved in a little alcohol and mixed with one or other of the essential oils and applied to the skin of mice and rats, was carried into the deeper tissues and produced typical strychnine poisoning. The fixed oils had no such effect, as the following protocol reveals:

EXPERIMENT 1.—Strychnine, in a 1:1,000 solution, was incorporated in 0.5 cc. of various vehicles and applied to white rats. Cottonseed oil and strychnine, castor oil and strychnine and olive oil and strychnine had no effect. Oil of orange and strychnine and oil of wintergreen and strychnine each produced convulsions and death in ten minutes.

CONSTITUENTS OF ESSENTIAL OILS

Having demonstrated that most of the essential oils penetrate the skin and may be employed to convey other potent principles dissolved in them into the deeper tissues, I proceeded to inquire into the pharmacology of various chemical constituents of these compounds. Numerous pure chemical constituents have already been isolated from many of the essential oils, although many of them are of complex composition. These constituents are heterogeneous and include a large variety of terpenes, aromatic alcohols and their esters, a number of higher aliphatic alcohols, aldehydes, ketones, phenols and phenolic esters and esters of aromatic acids, and a number of sulfur compounds. The following is a list of some such compounds which I selected for study: phenmethylol, or benzyl alcohol, phenol, cymol, thymol, guaiacol, geraniol, menthol, linalool, apiol, carvacrol, eucalyptol, anethole, eugenol, safrol, isosafrol, amyl alcohol, hexyl alcohol, heptyl alcohol, octyl alcohol, nonyl alcohol, decyl alcohol, fenchyl alcohol, borneol (camphyl alcohol), citronellol, nerolin, terpineol, asarol, benzyl benzoate, benzyl acetate, vanillin, coumarin, benzaldehyde, cinnamic aldehyde, citral, heliotropin, camphor, fenchone, menthone, carvene, pulegone, thujone, methyl salicylate, turpentine, pinene, dipentene, phellandrene, limonene, salicylaldehyde and sulfur compounds.

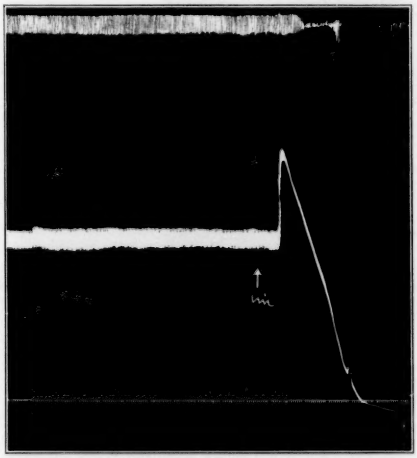

Fig. 1.—Effect of one drop of nicotine on the normal pharynx of a cat under ether anesthesia.

The absorption of small quantities of these dissolved in alcohol, combined with other members of the series and applied to the integument of various animals was carefully investigated. Small animals (mice and rats) proved especially useful in such studies. More promising compounds were later studied for their penetration through the skin of larger animals. Absorption was generally detected by physiologic and pharmacologic reactions of the animals and in some cases by chemical tests of the urine or blood. Some of the compounds, like the essential oils themselves, produced primary excitement followed by depression, others were depressant from the outset and still others were violent convulsants. The effect of fenchyl alcohol diluted with ethyl alcohol may be cited as typical of the pharmacologic response usually obtained:

EXPERIMENT 2.—Three cc. of 90 per cent ethyl alcohol applied to the back and abdomen of rat 1, weighing 160 Gm., caused some irritation but no other sign of poisoning.

11. Malowan, S. L.: Ueber die keimtötende Wirkung der ätherischen Oele, Ztschr. f. Hyg. u. Infektionskr. **112**: 93, 1931. Miller, R. E.: Bactericidal Efficiency of Essential Oils, Am. J. Pharm. **103**: 324 (June) 1931.

Three cc. of fenchyl alcohol applied to the back and abdomen of rat 2, weighing 170 Gm. at 10:16 a. m. caused some depression at 10:25, marked depression and dyspnea at 11:07, marked prostration at 11:35 and coma and shallow breathing at 12:55 p. m. At 4 p. m. the animal was half awake, and the next day it recovered.

Some of the other aromatic compounds were even more potent, such as safrol and isosafrol, minute quantities of which produced convulsions and death after application to all kinds of animals. More detailed description of various observations is published elsewhere.[11a]

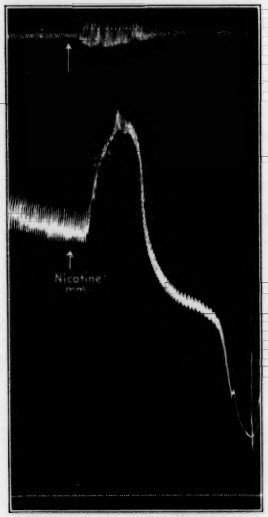

Fig. 2.—Effect of nicotine on the pharynx, previously painted with ephedrine hydrochloride, of a cat under ether anesthesia.

SOME AROMATIC COMPOUNDS AS VEHICLES

Having already employed the essential oils themselves as vehicles for minute doses of other potent drugs, I proceeded to make similar use of their constituents. Active drugs, such as alkaloids, glucosides and antiseptics, were dissolved in various aromatic constituents of essential oils, usually with ethyl alcohol, and the solutions were applied to the skin. An experiment with strychnine will serve as an illustration:

Experiment 3.—When applied to the back of mouse 1, 0.4 cc. of a mixture of eugenol and alcohol (1:1) caused coma in one hour. The animal recovered the next day. Two-tenths cc. of the same mixture containing 1 mg. of strychnine was applied to the back of mouse 2 at 2:22 p. m. At 2:34 p. m. 0.2 cc. more was applied. At 2:45 p. m. hyperexcitability was present. Convulsions and death occurred in two hours.

Table 2 shows the drugs thus studied and the methods of their detection.

ABSORPTION THROUGH NORMAL VERSUS PATHOLOGIC SKIN AND MUCOUS MEMBRANES

Nicotine is one of the most potent poisons known to man, being second in point of lethal dose to but one other alkaloid—aconitine. This poison, though employed extensively by men and women as a sort of narcotic stimulant and sedative in the form of tobacco, has no place in rational pharmacotherapy. For the research physiologist and pharmacologist, however, the alkaloid is a valuable test agent because of its selective action for the autonomic ganglions and because of its ready penetration of skin and mucous membranes. A drop of nicotine is readily absorbed when applied to shaven skin of anesthetized rats, guinea pigs and rabbits. When applied to the shaven abdomen of rats anesthetized with urethane,[12] the alkaloid first stimulates and then gradually paralyzes the respiration and finally produces death. A drop of nicotine alkaloid, placed on any mucous membrane of an animal, such as the tongue, pharynx or conjunctiva, is rapidly absorbed and produces the characteristic picture of nicotine poisoning; i. e., primary stimulation of the medullary centers and the heart ganglions, followed immediately by their paralysis and by death in a few minutes.

I have used this toxicologic property of nicotine to advantage in studying the rate of absorption through normal and abnormal mucous membranes of deeply anesthetized laboratory animals. A small drop of the alkaloid (0.05 cc.) placed on the pharynx of a cat, rabbit or dog under ether anesthesia rapidly penetrates the mucous membrane and produces death in a few minutes. After the mucous membrane of the pharynx was scalded, frozen or treated with phenol, silver nitrate, mercury bichloride, epinephrine, ephedrine, mercurochrome, tincture of iodine or gentian violet, such experiments with nicotine were repeated. It was found that absorption of nicotine was markedly retarded after previous treatment of the mucous membrane with some reagents, whereas after application of others the alkaloid penetrated as readily as it did in case of normal animals. Thus after the pharynx was painted with epinephrine, ephedrine or mercurochrome, absorption of nicotine was not delayed, whereas after the pharynx had been treated first with glycerite of tannin, silver nitrate or phenol, penetration of the alkaloid was markedly retarded. Absorption of nicotine through mucosa previously partially destroyed or injured (with the animal under anesthesia) by freezing or scalding was also greatly retarded. The alkaloid rapidly penetrated mucosa to which weak solutions of cocaine had been applied, but not those treated with cocaine "mud," which produced superficial necrosis of the cells.

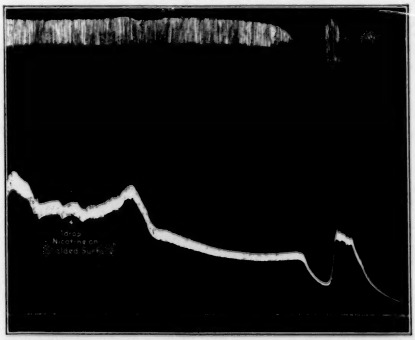

Fig. 3.—Absorption of nicotine through the injured mucosa of the previously scalded pharynx of a cat under ether anesthesia.

In general it may be stated that such reagents as did not produce destruction of superficial cells interfered but little with absorption of nicotine, whereas more powerful reagents producing more or less necrosis of the surface cells retarded penetration of the alkaloid. The same was found to be true with regard to

11a. Arch. internat. de pharmacodyn. et de thérap., to be published.

12. Macht, D. I., and Hill, P. S., Jr.: Urethane—Rat Preparation for Study of Intestinal Peristalsis, Proc. Soc. Exper. Biol. & Med. 26:871 (June) 1929.

absorption of nicotine through normal and pathologic skin of rats, rabbits and cats. Here again nicotine penetrated more rapidly through normal healthy skin than through skin previously injured by corrosive or destructive chemicals or physical reagents such as heat and cold.

These observations regarding the penetration of nicotine through the skin are in complete accord with those of Macht, Anderson and Bell [13] concerning the penetration of ultraviolet rays through living skin as compared with dead or partially necrosed tissue. The accompanying tracings illustrate some of the data obtained in these experiments, data of obvious clinical importance as they throw light on the rationale of some hitherto unexplained therapeutic procedures. These experiments indicate not only that tannic acid is an astringent but that it tends to retard absorption of toxic matter from the mucous membrane. Similarly, they furnished further proof of the rationality of the modern treatment of burns by application of tannic acid and silver nitrate solutions to burned areas of human tissue.

TABLE 2.—*Penetration into the Animal Body of Active Drugs Incorporated in Aromatic Vehicles*

Active Drug Absorbed	Test Object	Signs of Penetration and Absorption
Morphine	Mice	Straub phenomenon*
Apomorphine	Mice	Straub phenomenon
Apomorphine	Dog	Nausea and retching
Apocodeine	Mice	Straub phenomenon and purgation
Strychnine	Mice	Excitement and convulsions
Strychnine	Rat	Excitement and convulsions
Strychnine	Guinea pigs	Excitement and convulsions
Aconitine hydrochloride	Guinea pigs	Bronchoconstriction and "asthma," slowing of heart, delirium cordis and death
Quinine sulfate	Guinea pig	Phytotoxic reaction of blood†
Cocaine alkaloid	Guinea pig	Phytotoxic reaction of blood†
Pilocarpine hydrochloride	Rabbit	Salivation, myosis, slow heart beat, purgation
Physostigmine salicylate	Rabbit	Myosis, slow heart beat, purgation
Atropine sulfate	Rabbit	Mydriasis
Atropine sulfate	Cat	Mydriasis
Curare	Mice	Paralysis of the respiratory muscle
Thallium acetate	Guinea pig	Lethal effect
Insulin‡	Rats	Convulsions; blood sugar determinations
Heparin‡	Guinea pigs	Coagulation time

* Straub, W.: Eine empfindliche biologische Reaktion auf Morphin, Deutsche med. Wchnschr. **37**: 1462, 1911. Macht, D. I.: A Pharmacodynamic Analysis of Straub's Morphine Reaction, Proc. Soc. Exper. Biol. & Med. **17**: 100, 1920.

† Macht, D. I., and Livingston, M. B.: Effect of Cocaine on the Growth of Lupinus Albus: A Contribution to the Comparative Pharmacology of Animal and Plant Protoplasm, J. Gen. Physiol. **4**: 573 (May) 1922.

‡ Investigations in progress.

COMMENT

A number of research projects concerning absorption of drugs, poisons and chemicals through skin and mucous membranes yielded interesting and helpful information. It was found that fixed oils and fats at best are but poor vehicles for carrying other drugs into the deeper layers of the integument. On the other hand, it was discovered that the so-called essential, aromatic or volatile oils, a large group of drugs hitherto employed mostly as flavoring and perfuming agents and carminatives (with the exception of oil of wintergreen) rapidly penetrated intact skin and produced profound physiologic and pathologic effects often ending in death. Some of these volatile oils were employed as vehicles for more powerful drugs, such as various alkaloids, and promoted their absorption through the intact skin.

Studies of a series of pure chemical constituents of the volatile or essential oils revealed that most of them are also easily absorbed through not only the mucous membrane but also the integument. Many of these chemicals are quite poisonous, but when diluted with alcohol and other solvents they may be utilized as vehicles for carrying other active drugs into deeper layers of the skin and into the systemic circulation. Thus it has been demonstrated experimentally that the penetration of the skin of mice and rats by morphine, strychnine, atropine, pilocarpine and other drugs can be facilitated by incorporating them in such vehicles.

This discovery, obviously of considerable importance from the standpoint of applied therapeutics, offers a rational basis for various time-honored therapeutic procedures employed by the best of the older physicians. It was shown, for instance, that the use of phenol in glycerin for infection of the middle ear has a rational basis. It has also been demonstrated by these experiments that the efficacy of turpentine stupes applied to the abdomen for the relief of gas pains is actually due to the absorption of the terpenes through the skin. Even the use of opium lotions for injuries to the eye has a rational pharmacologic basis. Again, studies on pathologic mucous membranes and skin were found to speak for the efficacy of astringents in the treatment of diseases of the throat and experimentally support the modern treatment of burns with tannic acid and silver nitrate.

In the present paper I have purposely refrained from citing clinical data obtained in connection with my studies on volatile oils and their constituents. Such clinical data are already in hand, but the subject is still under investigation. No great stretch of imagination is required to grasp the therapeutic possibilities suggested by the discovery of a large series of chemical compounds which may be employed as vehicles for active drug principles, fungicides and other useful therapeutic agents.

SUMMARY AND CONCLUSIONS

1. Experiments with ointments and lotions prepared with fixed fats and oils—petrolatum, hydrous wool fat, lard, olive oil and linseed and cottonseed oils—indicate that none of these are very efficient in promoting absorption of drugs incorporated in them through normal skin. Hydrous wool fat was a more effective vehicle than other members of this series.

2. A large group of essential or volatile oils, official and nonofficial, on the other hand, was readily absorbed through the intact skin of various animals, as indicated by physiologic and biochemical reactions occurring after their application.

3. Many pure chemical constituents obtained from volatile oils or synthetically prepared were found to be absorbed rapidly through the normal skin.

4. A number of the volatile oils as well as some of their constituents were successfully used as vehicles to introduce into the body various potent alkaloids and other drugs.

5. Toxicologic experiments with nicotine revealed that it is rapidly absorbed through both mucous membranes and intact skin. Advantage was taken of this toxicologic property of the drug in investigating its penetration through diseased and pathologic tissues of animals under deep anesthesia as compared with normal surfaces of the body. Such studies revealed differences between normal and injured skin and mucous membrane.

13. Macht, D. I.; Anderson, W. T., Jr., and Bell, F. K.: The Penetration of Ultraviolet Rays into Live Animal Tissues, J. A. M. A. **90**: 161 (Jan. 21) 1928.

ABSTRACT OF DISCUSSION

DR. ISAAC R. PELS, Baltimore: This contribution by Dr. Macht is noteworthy from the standpoint that it illustrates the evaluation of various drugs that penetrate the skin through a method that has not been universally used. The fact that he stressed the penetration of animal fats is, of course, important. We all know that; but I wish he had said something, and he probably does in his paper, regarding the use of vanishing creams and their pharmacologic action. A discussion of the scientific details of this paper obviously lies within the province of the properly qualified expert. Therefore I shall limit my discussion to generalities and to a brief comment on its practical importance. The skin has always been an acceptable and fruitful field for functional and therapeutic studies and naturally will continue to be so. It is indeed an amazing experience to take account of the numerous investigations of medicaments, poisons and chemical agents in their effects on the skin and on the body. Some twenty-five years ago Unna, in his studies of chemistry of the skin, concluded that certain few solid and liquid substances (caustic acids and alkalis, phenols) as well as all gaseous and vaporous bodies, can penetrate the skin and, contrariwise, all soluble, indifferent substances, such as neutral salts, cannot. Dr. Macht has at least given us a serious incentive to improve this situation by suggesting additional methods of experimental study in the use of drugs and vehicles, volatile oils and their components. Whatever effects these studies may reveal on the cells, circulation, nerves and adnexa of the dermis from the physical, functional, chemical and pathologic standpoints must be deferred to future studies. The interpretation by pharmacologic methods, however, of changes and effects would seem to be more conclusive than the interpretation of purely biologic changes. Furthermore, in recording the results of penetration of the skin and mucous membranes the important factor of the limits of safety in the application of these experimental substances has been indicated or suggested by the author. Every practitioner realizes the indications for and the value of symptomatic, palliative and expectant therapy, particularly when the etiology remains obscure. Stimulating, inhibitory and destructive procedures, in other words radical therapy which aims to "change the soil" of pathologic conditions of the skin, appears to be the field for investigation to which Macht has drawn our attention.

DR. THEODORE CORNBLEET, Chicago: I was interested to hear that Dr. Macht found that the essential oils, ketones and their related substances do not penetrate as well through the pathologic skin as through the normal skin. I have tackled this problem in a somewhat different way, through a study of the ketone excretion in the urine. In this study I found that the amount of ketones in the urine increased proportionately to the size of the area of skin involved in any kind of a dermatitis. Now it appears that these ketones, which occur ordinarily on the skin surface in the sweat, penetrate the skin with difficulty when there is a dermatitis present and as a result are excreted instead through the urine. Inflamed skin acts, therefore, as a barrier to both materials at the surface and in the lymph and blood. My feeling is that this problem is related to a type of equilibrium between constituents of the blood and the secretions at the surface of the skin. For instance, there is some evidence at the present time that cholesterol and like products are excreted to the surface of the skin and then reabsorbed. In this way, perhaps, many substances are excreted and finally reabsorbed after modification. This process is interfered with at an inflamed site.

DR. DAVID I. MACHT, Baltimore: Dr. Pels mentioned greaseless creams. These are the worst vehicles of all and it is not surprising, as these are really soaps, soap suds with an addition of a little oil to make them stick and look nicer. I want to stress particularly a few words regarding the difference between normal and pathologic skin in relation to absorption, because I did not speak enough on the subject when I read my paper. It seems, as a result of all my experiments, that living tissues are more easily penetrated by chemicals than dead tissues, with one exception. If a burn is produced by an actual cautery, with a raw wound and open vessels, there occurs, of course, marked absorption, but if a burn is produced by scalding, there is coagulation of proteins and the absorption is practically nil. These facts with regard to the difference between normal and pathologic skin and mucous membranes in respect to penetration of drugs are parallel to the results of experiments reported by Dr. Anderson, Dr. Bell and me some years ago with regard to the penetration of ultraviolet rays through skin and mucous membranes, which most dermatologists are also interested in. We have shown that penetration of these rays, even of short ultraviolet rays, is much greater through living tissue than was supposed. The trouble was that previous experimenters made their experiments either on leather or on dead skin, and there, of course, that had altogether different conditions and results. I was interested in the statement made by Dr. Cornbleet regarding the ketones in relation to normal and pathologic skin surfaces, because that fits in very well with my observations.

EFFECTS OF VITAMIN B (B_1) THERAPY ON THE POLYNEURITIS OF ALCOHOL ADDICTS

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Prior to the recognition of the rôle played by vitamins, polyneuritis in the alcohol addict was usually attributed to the direct toxic action of alcohol. Shattuck,[1] Minot[2] and Wechsler[3] suggested that avitaminosis probably played an important rôle in the production of this type of polyneuritis. Several investigators then specifically indicted vitamin B. This opinion was based primarily on the following observations: first, that patients with "alcoholic" polyneuritis had as a rule an inadequate food intake; second, that "alcoholic" polyneuritis and beriberi showed similar clinical and pathologic manifestations.[4] In addition it was observed that these subjects improved when given diets rich in vitamin B and that when such diets were supplemented by vitamin B concentrates improvement occurred even while the subjects were given from a pint to a quart of whisky daily.[5]

Recent fundamental contributions have made possible a more direct approach to the study of the etiology of syndromes suspected of being on the basis of vitamin B deficiency. The first of these contributions was Cowgill's[6] determination of the vitamin B requirement of man and of a formula by which this requirement can be predicted. Cowgill's formula has been confirmed clinically by Baker and Wright[7] and

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Owing to lack of space, this article is abbreviated in THE JOURNAL by omission of the tables. The complete article appears in the authors' reprints.

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From the departments of Medicine and Psychiatry, New York University College of Medicine, and the Psychiatric Medical Service of the Third (New York University) Medical Division, Bellevue Hospital.

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Van Veen [8] abroad and by Jolliffe, Colbert and Joffe [9] in this country. The next contribution was the production of crystalline vitamin B_1 in amounts sufficient for clinical investigation.[10]

Using Cowgill's formula, Jolliffe, Colbert and Joffe [9] in a study of reliable dietary histories of forty-two alcohol addicts showed, first, that the diets of alcohol addicts with polyneuritis failed over an effective period of time to contain adequate quantities of vitamin B; second, that the diets of alcohol addicts without polyneuritis, though the addiction was of long duration, contained adequate quantities of vitamin B; and, third, that certain subjects without polyneuritis consumed enough alcohol over a sufficient period of time to cause peripheral nerve involvement if alcohol per se was its cause.

Jolliffe and Colbert [11] then presented evidence that the rate and the degree of improvement in the objective signs of polyneuritis were roughly proportional to the vitamin B intake in twenty-eight alcohol addicts with uncomplicated polyneuritis who were given diets containing one time (group A), two times (group B) and four times (group C) the estimated vitamin B requirement of subjects weighing 60 Kg.

If the rate and degree of improvement of subjects treated by diets containing approximately four times their vitamin B requirement could be enhanced by a further increase in vitamin B, without otherwise changing the diet, the belief that polyneuritis in the alcohol addict is a manifestation of vitamin B deficiency would receive added support. This is our purpose in the present study.

We are cognizant of the fact that other factors than vitamin B deficiency may cause a peripheral neuritis. These may and do operate in the alcohol addict as well as in subjects not addicted to alcohol. We are also aware of the hazards of drawing conclusions as to etiology from therapeutic results. Improvement in these patients, or the degree of their saturation with vitamin B, cannot as yet be gaged by a practical laboratory procedure. Furthermore, peripheral neuritis is a chronic disease, subject to wide variations in degree of involvement, occurring in subjects who frequently have a multiple rather than a single deficiency and in whom the pathologic changes, because of extent or duration, may be so far advanced as to be irreversible. For these reasons, in a study of etiologic factors by therapeutic methods it is necessary that the subjects treated should present, at least clinically, no evidence of other deficiency diseases, and the changes in their peripheral nerves should at least appear to be reversible. We have accordingly chosen for this study patients who have a mild degree of involvement and whose polyneuritis we therefore believe, in the absence of a reliable history, to be of relatively short duration.

METHODS

The criteria we have used to designate mild polyneuritis are as follows: The signs must be limited to the lower extremities, with the knee jerks preserved and with no obvious muscle atrophy or foot drop; the patient must show absent ankle jerks plus some demonstrable sensory change such as muscle tenderness, skin hyperesthesia in a peripheral nerve distribution, and impairment of the vibratory or position sense. As in previous studies, the tendon reflexes are reported only as being present or absent, and sensory changes are reported as to extent but not as to degree. In an earlier study [11] the efficacy of treatment by varying amounts of vitamin B was compared at the end of twenty-one days. The thirteen subjects who were treated with a diet containing approximately four times their predicted requirement of vitamin B had various degrees of involvement, the severity rating of the polyneuritis being as follows: mild, three cases; moderate, eight; severe, two. As a group, ten (77 per cent) showed motor improvement, and eleven (85 per cent) showed sensory improvement at the end of twenty-one days. A review of the case histories disclosed, however, that at the end of ten days only four (30 per cent) showed motor improvement; the same four patients were also the only ones showing sensory improvement. If again increasing the vitamin B intake would advance recovery, a ten day period of observation offered an obviously better comparative basis than twenty-one days. We have therefore made the comparison of changes in objective signs of polyneuritis at the end of ten days.

On admission to the medical wards, each subject having a polyneuritis was given a basal diet [11] containing a vitamin calory ratio of 1.7, plus 18 Gm. of autoclaved vegex. As we have previously shown, this diet, which is of borderline adequacy in vitamin B for a subject weighing 60 Kg., results in no improvement in objective signs of peripheral neuritis. The subjects were maintained with this diet for from three to five days, during which time it was determined whether the patient was cooperative and whether complications existed. Conditions likely to increase the vitamin B requirement or prevent its absorption or utilization were considered complications. The subjects having these conditions are not reported. Jaundice, ascites or signs of liver cirrhosis did not cause exclusion from this study. If the patient was suitable for further study he was then given a weighed diet containing a vitamin/calory ratio of 5.5, plus 18 Gm. of unheated vegex, which increased the vitamin/calory ratio to 6.8, approximately four times the vitamin B requirement of the subject weighing 60 Kg. To alternate subjects we gave in addition 10 mg.[12] of crystalline vitamin B_1[13] freshly dissolved in 2 cc. of physiologic solution of sodium chloride, by intravenous injection at daily intervals. This amount of crystalline vitamin B_1, calculating 1 mg. as equal to 6,660 mg. equivalents of Cowgill, increased the vitamin/calory ratio to 28.3, or about sixteen times the vitamin B requirement of a subject weighing 60 Kg. Of the subjects studied, seventeen fulfilled our criteria for a mild polyneuritis; eight of these received crystalline vitamin B_1, and nine dietary treatment alone. The latter group served as a control for those treated with the crystalline preparation. We have designated the control subjects group C, since their treatment was identical with that of group C in a previous study. The subjects receiving 10 mg. of crystalline vitamin B_1 daily for ten days we have designated group D. Observations were made by the same observer and checked at frequent intervals by the second observer during the ten day period.

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12. One mg. of the crystalline substance is equivalent to 333 international units.
13. Courtesy of Merck & Co., Inc., Rahway, N. J. We have used both Vitamin B_1 Merck Natural Crystals, and their synthetic product Betabion.

RESULTS

Observations on the objective neurologic signs of peripheral nerve involvement in the nine patients in group C, and the results of maintaining them with a diet containing a vitamin/calory ratio of 6.8, are summarized in table 1. Observations on the eight patients in group D, maintained with the same diet as those in group C but who received in addition 10 mg. daily of crystalline vitamin B_1, are summarized in table 2. The results in the two groups at the end of the ten day period are compared in table 3. Subjects in group D, by every method of comparison, showed greater improvement than the control subjects in group C. At the end of the ten day period only one (11 per cent) of the subjects in group C was considered cured, but four (50 per cent) of the subjects in group D were so considered. Motor improvement was observed in two (22.2 per cent) of the subjects in group C, while five (62.5 per cent) in group D showed motor improvement. Sensory improvement occurred in four (44.5 per cent) subjects in group C, and in all of group D.

These results are remarkable, but the conditions of this study must be borne in mind. These subjects had but a mild polyneuritis and, as far as we are aware, presented no clinical evidence of another deficiency disease or other complications as previously defined. Patients manifesting evidence of a more severe polyneuritis, when treated as those in group D, occasionally exhibit dramatic improvement. Subject 7, previously presented by Jolliffe and Colbert[11] in table 4 of their paper, illustrates this dramatic response. This subject, following the administration of 20 mg. of natural crystalline vitamin B_1, showed within forty-eight hours a return of the knee jerks, a disappearance of the foot drop and striking improvement in the sensory status. Such dramatic response in a patient with more than a mild polyneuritis has not since been observed, though we have treated more than sixty patients with various diets and varying amounts of vitamin B. Because of the wide variations in the degree and duration of involvement, and the various complications present in the subjects having more than a mild polyneuritis, we have as yet too few cases in the several groups from which to draw any conclusions. However, since our results may suggest the correct solution of certain problems in vitamin B therapy, some of these problems will be illustrated in the following cases:

CASE 46.—An actress, aged 35, was brought to the hospital April 1, 1936, by her husband, who stated that she had been drinking heavily for eight or nine years and had been eating little during the past year. Six months prior to her admission, ascites developed. Three abdominal paracenteses were performed, the last a week before admission. On physical examination she showed a moderately severe polyneuritis with absent triceps, knee and ankle jerks. Vibratory sensation was absent in the ankles and below, and position sense was absent in the toes. There was calf muscle tenderness, stocking hyperesthesia extending to the midthigh, and glove hyperesthesia extending to the elbows. In addition, she had a hydrothorax, marked ascites and dilated abdominal veins. The spleen felt firm and was palpable three fingerbreadths below the costal margin; the liver was just palpable. There was no edema of the lower extremities, nor were there any signs of congestive heart failure, such as dilated veins in the neck, orthopnea or dyspnea. The heart was not enlarged on roentgen examination. The patient was given the diet and vegex received by group C, the fluid and salt intake was not restricted, and no medication other than sedatives was given. On the ninth day a gain in weight of 3½ pounds (1,587 Gm.) and increasing abdominal distention necessitated abdominal paracentesis. Twenty pounds (9 Kg.) of clear, straw colored ascitic fluid was removed. By this time improvement in the neurologic signs had occurred. The triceps jerks had returned; glove and stocking hyperesthesia had diminished, and the vibratory sensation had returned in the ankles, continuing to be absent only in the toes. The same regimen was continued. By the twenty-first day a gain in weight of 10½ pounds (4.8 Kg.) had occurred. Paracentesis was again performed and 8 pounds (3.6 Kg.) of ascitic fluid removed. Further neurologic improvement had occurred by this time in that the knee jerks had returned and the glove hyperesthesia had completely disappeared. Beginning on the twenty-second day, 10 mg. of natural crystalline vitamin B_1 was administered daily by intravenous injection for five consecutive days. By the twenty-eighth day the stocking hyperesthesia had diminished to the ankles, calf muscle tenderness was absent, and vibratory and position sense were intact, though the ankle jerks remained absent. The patient was now mentally clear. From the twenty-second day to the twenty-eighth day the patient gained 8 pounds (3.6 Kg.) and there was sufficient ascites so that a fluid wave in the abdomen could be elicited. But further increase in ascites did not occur; the weight first became stationary, and on the thirty-sixth day she began to lose weight. By the forty-eighth day she had lost 11 pounds (5 Kg.), and evidence of ascites had disappeared. During this period the neurologic signs remained unchanged from those of the twenty-eighth day. By the sixty-sixth day the patient had gained 4 pounds (1.8 Kg.), but there was no evidence of ascites or edema. The ankle jerks remained absent but the stocking hyperesthesia had diminished so that it now involved only the plantar surface of the feet. To note the effect on the remaining signs of polyneuritis, 10 mg. of natural crystalline vitamin B_1 was administered daily by intravenous injection for five days. By the seventy-second day the ankle jerks had returned and the hyperesthesia had disappeared. The patient was discharged June 15, 1936, without signs of polyneuritis or mental disease. The spleen remained palpable to the same extent as on admission, but the distended abdominal veins were now less prominent. She then was treated as an outpatient with a diet rich in vitamin B supplemented by three teaspoonfuls of vegex daily, and to the present (eleven months later) alcoholism, ascites or polyneuritis has not returned.

The response of this patient indicates that cirrhosis of the liver may not interfere with either the absorption or the utilization of vitamin B. During the first twenty-one days, when the treatment was entirely oral, the response was about the average obtained in other patients with as severe a neuritis but without clinical evidence of cirrhosis. The addition of crystalline vitamin B_1 on two occasions approximately quadrupled the vitamin B intake, and the increased response during those two periods can be attributed to that fact.

Patients having polyneuritis may show relatively little response to vitamin B therapy as judged by the objective signs of peripheral nerve involvement, especially in the motor phase. This lack of satisfactory response, granted that the etiology is vitamin B deficiency, is most likely due to an irreversible anatomic lesion. This irreversibility may be due to either a severe deficiency over a short period or a mild or moderate deficiency over a longer period.

CASE 47.—A policeman, aged 35, was admitted to the hospital Nov. 11, 1936, his third admission to this service because of alcoholism. His first admission, May 2, 1936, was occasioned by a hematemesis. At that time he showed signs of a mild polyneuritis with absent ankle jerks, absent vibratory sensation in the toes, marked tenderness of the calf muscles, and plantar hyperesthesia. The position sense in the toes was maintained, the gait was natural, and no muscle atrophy was noted. The patient received the house diet for hematemesis and was discharged, May 31, with the polyneuritis unimproved. He continued to drink a quart of whisky daily, ate poorly and was readmitted June 3, at which time the polyneuritis was still considered mild. He was discharged two weeks later and promptly resumed his intemperate habits. On the present admission, occasioned by inability to walk, the knee jerks were preserved, the ankle jerks were absent and vibratory sensation was absent in the pelvis and below. Position sense in the toes was intact, but

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marked tenderness of the calf muscles, plantar hyperesthesia and atrophy of the calf muscles were present. The tongue was completely bald. There were dilated veins over the lateral walls of the abdomen extending up to the level of the axilla and down to the midthighs. The spleen was not palpable, but the liver extended to within a fingerbreadth of the umbilicus. There was no edema, ascites, jaundice or signs of congestive heart failure. The patient was given the same treatment as subjects in group C and in ten days showed sensory improvement in that vibratory sensation was now absent only in the toes. Continuing with the same diet, and beginning on the eleventh day of study, 10 mg. of synthetic crystalline vitamin B_1 was given by intravenous injection for thirty consecutive days. By the seventeenth day, i. e., following 60 mg. of crystalline vitamin B_1, the tenderness of the calf muscles had disappeared. By the twenty-sixth day, after 150 mg. of crystalline vitamin B_1, the plantar hyperesthesia had disappeared, but the ankle jerks had not returned and the vibratory sense remained absent in the toes. No further improvement occurred by the forty-third day, or after 300 mg. of crystalline vitamin B_1. At this time the dose of synthetic crystalline vitamin B_1 was increased to 50 mg. daily and continued for ten days, but there was no further improvement in the objective signs of polyneuritis. During his stay in the hospital the patient's weight increased from 132 to 155 pounds (60 to 70 Kg.), associated with a marked increase in strength. On admission it had been impossible for the patient to stand, but by the twenty-first day he could walk on a wide base, and on discharge the gait was considered normal.

The response in this subject, as measured by the objective signs of polyneuritis, was limited to improvement in the sensory status. Although objectively there was little improvement, functionally the ability to walk, probably occasioned by the marked gain in strength, is not to be ignored. The failure of the ankle jerks to return after 800 mg. of synthetic crystalline vitamin B_1 had been administered during forty-three days is due, we believe, to relatively irreversible anatomic changes in the peripheral nerves occasioned by the long duration of a mild vitamin B deficiency.

CASE 48.—A man, aged 35, a vagabond, admitted to the hospital Dec. 3, 1936, complained of marked weakness and pains in the legs and swelling of the ankles during the preceding few days. Because of the patient's mental status, a reliable history was unobtainable. Examination showed a moderately severe polyneuritis with absent ankle and knee jerks. The vibratory sensation was absent in the pelvis and below, but position sense was intact. There was marked tenderness of the calf muscles and plantar hyperesthesia but no muscle atrophy. In addition there was an icteric tint to the sclerae, and a firm but tender liver was palpable five fingerbreadths below the costal margin. There were a few dilated lateral abdominal veins, but ascites was not present and the spleen was not palpable. Edema of the ankles was noted on admission but disappeared by the next day, and there were no signs of congestive heart failure. The patient was given the same diet and vegex as the subjects in group C. At the end of ten days no improvement was noted. The patient was then given, in addition, 10 mg. daily of natural crystalline vitamin B_1 by intravenous injection for thirty consecutive days. On the forty-first day of study, after the administration of 300 mg. of crystalline vitamin B_1, the only improvement in objective signs of polyneuritis was the disappearance of the tenderness of the calf muscles. Beginning on the forty-second day, 50 mg. of natural crystalline vitamin B_1 was administered daily for five consecutive days. At the end of this period the plantar hyperesthesia had disappeared and the patient was able to walk unassisted but on a wide base; the knee jerks and ankle jerks, however, remained absent. Jaundice had disappeared but the liver remained palpable five fingerbreadths below the costal margin.

In this subject the improvement in the objective signs of polyneuritis was limited to the disappearance of muscle tenderness and plantar hyperesthesia. Functional improvement was limited to an improvement in strength. On admission the patient could not stand unassisted. At the end of forty-seven days of treatment, during which time he had received 610 mg. of natural crystalline vitamin B_1, he was able to walk unassisted, without a cane, but on a wide base. The lack of improvement in the objective signs of motor nerve involvement we believe to be due to relatively irreversible anatomic changes in the peripheral nerves occasioned by an acute vitamin B deficiency.

CASE 49.—A "man about town," aged 39, was admitted to the hospital Feb. 1, 1936, because of complete inability to care for himself. He had been drinking about one quart of whisky daily for the past ten years. His appetite had been maintained until five months prior to admission, when he noted its failure, and for the past month he had eaten very little. Examination six months prior to admission showed no evidence of polyneuritis, but on admission there was absence of all tendon reflexes in the upper and lower extremities, with a bilateral foot drop and weakness of the hand grips. There were no signs of congestive heart failure, but the liver was palpable, firm and slightly tender two fingerbreadths below the umbilicus. There were a few visible lateral abdominal veins. The spleen was not palpable. A fluid wave and shifting dulness could not be elicited. The patient was given the diet and vegex received by group C, plus 20 Gm. of a vitamin B concentrate[14] by mouth, bringing the vitamin/calory ratio up to 14. Within two weeks the foot drop, muscle tenderness and stocking hyperesthesia had disappeared. The biceps and triceps jerks had returned, but the knee jerks and ankle jerks remained absent. The vibratory sensation remained absent in the toes, but the position sense was intact. At the end of twenty-one days the knee jerks had returned and the patient was able to walk on a slightly widened base. He was then treated as an outpatient, taking approximately the same diet and vitamin B as in the hospital. By June 1 all signs of polyneuritis had disappeared except absence of ankle jerks. The liver was now palpable only on deep inspiration. This regimen was continued till December 15, at which time the patient was given 50 mg. of natural crystalline vitamin B_1 by intravenous injection three times a week for fifteen doses. The ankle jerks were still absent at the conclusion of this period.

This case illustrates an excellent sensory and motor response in a subject having an acute polyneuritis in all objective manifestations except a return of the ankle jerks. These are probably permanently lost, owing, we believe, to the severity of the vitamin B deficiency and the resulting irreversible neural lesion.

COMMENT

Additional evidence that vitamin B deficiency is the cause of the polyneuritis of the alcohol addict is furnished by a comparison of the response of subjects in group C and group D. The more rapid and complete improvement of the latter is definite. Since the two groups received identical weighed diets and oral vitamin B supplements, the greater response of group D can be attributed only to increasing the vitamin B intake over that received by group C, or to chance. In a previous study Jolliffe and Colbert[11] attributed the improvement of subjects in group B, as compared with the lack of response in group A, to doubling the vitamin B intake without otherwise changing the diet. They were at that time unable with certainty to attribute the greater improvement in group C than in group B solely to the increase in vitamin B, since not only the vitamin B intake of group C was doubled as compared with group B, but calories, protein, mineral salts and the other vitamins were also increased. Since group D in the present study received the same diet and oral vitamin B supplement as group C in this and in the previous study, we now believe that the greater improvement in group C as compared with

14. Rhyzamine B, Burroughs Welcome & Co., Inc., New York.

group B was due primarily to the increase in vitamin B; since the improvement was roughly proportional to the vitamin B intake, we do not believe that chance significantly influenced our results.

Although motor and sensory improvement occurred in patients receiving daily twice the predicted vitamin B requirement of a subject weighing 60 Kg., this was minimal. It was not until four times the predicted requirement was given daily that absent ankle jerks were observed to return within twenty-one days. We therefore believe that the dosage of vitamin B as frequently advised in the literature of many drug houses has been far too small. For curative results in vitamin B deficiency we believe that the intake of vitamin B should never be less than four times the patient's predicted requirement. We cannot say that 10 mg. of crystalline vitamin B_1 parenterally administered under these conditions is the optimum dosage. One-half the amount might have given equally good results, but doubling the 10 mg. dosage may still further enhance the results. These possibilities are under investigation. At present the determination of the optimum curative dose can be arrived at by clinical evidence only. A practical chemical procedure for the determination of vitamin B saturation, in place of the biological assay method of Harris and Leong,[15] is needed in order that each subject's vitamin B excretion in the urine may be followed at daily intervals over a long period of time. While such a method is desirable in following the mild cases of polyneuritis, it is almost indispensable in determining what the optimum therapeutic dose of vitamin B should be in those having a more severe polyneuritis. At present when the objective signs of polyneuritis fail to improve we are unable to decide whether the neuritis is on the basis of vitamin B deficiency, and, if so, whether the pathologic processes have gone on to irreversible changes or the patient is not yet saturated with vitamin B. Such problems occurred in subjects 47 and 48 after we had administered 300 mg. of crystalline vitamin B_1 intravenously, in addition to an oral intake of approximately four times the predicted requirement, and in subject 49 after eleven months of oral treatment. It may be that most of the vitamin B subsequently administered could have been recovered in the urine.

The rapid return of reflexes as noted in subjects 7,[11] 40 and 41 may occasion some surprise. This rapid recovery is not without precedent in the clinical experience of neurologists in other forms of neural disease, such as Landry's ascending paralysis.[16] In the avitaminotic B pigeon a complete inability to stand or fly may be replaced by normal activity within an hour following parenteral administration of vitamin B. When recovery follows so dramatically, it is inconceivable that actual nerve degeneration could be present. This statement is supported by numerous pathologic studies.[17] These observers rarely found significant histologic changes in acute experimental avitaminosis B. However, vitamin B unsaturation does lead to changes of the chemistry in the neural system.[18] These changes could reasonably produce physiologic alterations sufficient to cause areflexia and other signs of polyneuritis and, at the same time, be rapidly reversible following resaturation with vitamin B.

The disappearance of the ascites (in case 46) during the course of vitamin B therapy may have been due to a spontaneous remission. Though spontaneous remissions do occur in subjects having cirrhosis of the liver they are relatively rare, and we are inclined to believe that vitamin B played a part in this remission now lasting over eleven months. In subject 49 the liver was palpable below the umbilicus, but four months later it was palpable only on deep inspiration. This occurrence is not at all unusual in our alcohol addicts treated with vitamin B. It is possible that these large livers were not due to fatty cirrhosis but to congestive heart failure. If the latter is the true explanation, the large palpable liver was the chief or only sign of congestive heart failure in most of these subjects. We have treated five other subjects having cirrhosis and ascites. In four subjects, none of whom had polyneuritis, there was no clear evidence of beneficial response. In the fifth subject, who had polyneuritis, a beneficial response seemed to follow. Many subjects carefully studied and controlled over long periods will be required to establish the value of this therapeutic procedure in liver cirrhosis.

Although there was no reason to expect a difference in response to the administration of synthetic and natural crystalline vitamin B_1, we have, since the synthetic product was available, alternated our subjects between the two products. Equally good and negative results were obtained with the two, both in the subjects reported in this study and in our unreported cases.

SUMMARY

We have observed an additional group of seventeen alcohol addicts having uncomplicated mild polyneuritis who were given diets containing four times the predicted vitamin B requirement of a subject weighing 60 Kg. Alternate subjects were given by intravenous injection 10 mg. daily of either natural or synthetic crystalline vitamin B_1 for ten days. By every method of comparison the response of those receiving the crystalline supplement was better than that of the control group. Four histories selected from our group of subjects with more than a mild degree of polyneuritis illustrate problems encountered in the treatment of such subjects. Some patients having cirrhosis of the liver apparently respond by improvement to vitamin B therapy.

CONCLUSIONS

1. Vitamin B deficiency is the primary cause of the polyneuritis of the alcohol addict.

2. Improvement in the objective signs of polyneuritis in the alcohol addict varies directly with the vitamin B intake up to a point of optimum dosage, which, though not as yet determined, is definitely more than four times the predicted maintenance requirement.

ABSTRACT OF DISCUSSION

DR. GEORGE R. COWGILL, New Haven, Conn.: My experience in this field has been with experimental animals. I note that the patients were placed on basal diets with a fairly accurately determined vitamin B content, and known doses of the pure vitamin given in addition. These efforts to quantitize the clinical work constitute a real step forward. In our work with pigeons we learned that we could not obtain a satisfactory

15. Harris, L. J., and Leong, P. C.: The Excretion of Vitamin B_1 in Human Urine and Its Dependence on the Dietary Intake, Lancet **1**: 886-894 (April 18) 1936.

16. Collier, James: Peripheral Neuritis: Morrison Lecture, Edinburgh M. J. **39**: 601 (Oct.) 1932.

17. Wechsler, I. S.; Jervis, G. A., and Potts, H. D.: Experimental Study of Alcoholism and Vitamin B Deficiency in Monkeys, Bull. Neurol. Inst., New York **5**: 453-475 (Aug.) 1936. von Meduna, L.: Experimentelle B Avitaminose des Kaninchens, Arch. f. Psychiat. **80**: 480, 1927. Prickett, C. O.: The Effect of a Deficiency of Vitamin B_1 upon the Central and Peripheral Nervous Systems of the Rat, Am. J. Physiol. **107**: 459 (Feb.) 1934. Zimmerman, H. M., and Burack, Ethel: Lesions of the Nervous System Resulting from a Deficiency of Vitamin B Complex, Proc. Soc. Exper. Biol. & Med. **28**: 645 (March) 1931; Lesions of the Nervous System Resulting from a Deficiency of Vitamin B Complex, Arch. Path. **13**: 207 (Feb.) 1932.

18. Peters, R. A.: The Biochemical Lesion in Vitamin B_1 Deficiency: Appreciation of Modern Biochemical Analysis in Its Diagnosis, Lancet **1**: 1161-1164 (May 23) 1936.

curative test unless we used a dose from three to five times the minimum daily weight-maintenance dose. It is perfectly obvious that the clinical experience just reported accords well with our animal experience. I have frequently had occasion to advise my clinical colleagues to use much greater doses of vitamin B in their work, and this advice was based on our experience with experimental animals. Drs. Goodhart and Jolliffe reported that occasionally a patient would show dramatic improvement following the administration of liberal doses of vitamin B. This is quite comparable to what has been observed in experimental animals. However, not all patients responded so well. The same dose of vitamin B administered to our dogs did not always yield the same results. Evidently we could not gage accurately enough the severity of the state of extreme vitamin B deficiency. It was for this reason that I gave up trying to assay chemical fractions for vitamin B by a curative method. Some of the patients received as much as 10 and in some cases 50 mg. daily of crystalline vitamin B. If it is assumed that the average man requires about 1 mg. daily, these seemingly large doses are from ten to fifty times the daily minimum. From experience I should say they are not excessive. Doses of this order of magnitude in relation to the minimum have been widely used with experimental animals usually with the desired success. If one were to attempt to give such doses of vitamin B in the form of vitamin-rich foods or the cruder concentrates, simple calculation will show that perfectly enormous amounts of these materials would have to be given. With the pure vitamin now available for clinical use, I have little doubt that trials of it in the clinic in these larger and appropriate doses will reveal numerous conditions as involving a serious lack of vitamin B as at least one feature of the syndrome in question. Can too much vitamin B be given? Recent tests by Molitor have shown that it is possible to kill mice, rats, rabbits and dogs by administration of enormous doses of crystalline vitamin B. The lethal dose appears to be from 25,000 to 50,000 times the daily normal requirement. If it is assumed that these results may be translated to the human species, it appears that the lethal dose for man would be from 25 to 50 Gm. of the pure vitamin.

DR. MARTIN G. VORHAUS, New York: Drs. Goodhart and Jolliffe have added another chapter to the work on alcoholism which has been in progress at Bellevue Hospital for some time. This paper is an important step forward toward a better understanding of vitamin B_1 therapy. The authors have presented convincing evidence that large doses bring a greater percentage of good results in polyneuritis than moderate or small doses. In our first communication my co-workers and I suggested a daily dose of 10 mg. of vitamin B_1 in severe cases or in those of long standing. This dose has been employed in many of the reported cases. Some questions with regard to vitamin B_1 therapy that have been raised are: What are the symptoms of an overdose of vitamin B_1? Is there a toxic dose of vitamin B_1? The authors have given 50 mg. of vitamin B_1 daily by intravenous administration and have not noted any signs or symptoms of toxic effect. This is in accord with our experience. We have given as high as 90 mg. daily by mouth without observing any untoward effect. From these clinical observations it may be concluded that very large doses of vitamin B_1 may be given safely. Of especial interest to me is the occurrence of certain side effects of vitamin B_1 therapy. I refer to such clinical observations as failure of reaccumulation of ascites and the reduction in the size of the liver in certain cases. That such changes may be only coincidental is admitted but it is very important to point out that the therapeutic value of vitamin B_1 is undergoing critical study at present and its limitations are still not clearly defined. Weiss and his associates have reported changes in cardiac function in some cases on vitamin B_1 therapy. We are studying alterations in bone structures in cases of gout and certain types of osteo-arthritis on large doses of vitamin B_1 over a long period of time. There is a great deal yet to be learned about vitamin B_1 therapy, but one point is becoming more definite—as the authors have indicated—that often the dose of vitamin B_1 is too small or administered for too short a period to serve as a basis for thoroughly evaluating its benefit in a given case.

DR. TOM D. SPIES, Cincinnati: In the past six years I have been making clinical observations along this line. I can corroborate almost everything that the authors have said. They have gone much farther than I in many respects. There are a few practical points that might be accentuated. I feel that the dose of 10 mg., or four times that, is very small. In other words, I think they have not gone far enough, because I have had to give as much as 500 mg. on several successive days to get an alteration in cases such as they classed as irreversible. There are two factors, I think, that enter into the treatment of these particular persons: one is the size of the dose and the other is the factor of time. I am not at all sure that the authors gave an adequate dose, and some forty-odd days is not long enough in many of the cases. It takes months, literally months. In general, I am sure that alcoholic polyneuritis is in part at least a nutritional disease, and I am equally certain that vitamin B_1 is a factor.

DR. ROBERT S. GOODHART, New York: We are attempting by various methods to determine the optimum dose of vitamin B. We are at present using 5, 20 and 50 mg. doses in an effort to determine this point more accurately. There is no reliable chemical method of analyzing the urine in determining whether or not these patients are saturated with vitamin B. There is evidence that the polyneuritis due to vitamin B deficiency is in the early stages a physicochemical phenomenon. We feel that when rapid improvement occurs following vitamin B therapy this is due to the action of vitamin B in rectifying these physicochemical alterations. When rapid response does not occur and there is no obvious change in the polyneuritis over a three to four weeks period we are inclined to believe that there has been some actual anatomic degeneration. We also wish to point out that these alcohol addicts are not on a diet deficient alone in vitamin B_1 and therefore other deficiencies may and do complicate the picture. For example, it has been demonstrated by men in this work that vitamin A deficiency may be responsible for a peripheral neuritis.

THE TEACHING OF BODY MECHANICS IN PEDIATRIC PRACTICE

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The purposes of this paper are first to reemphasize the importance of body mechanics as a necessary part of preventive pediatrics, second to review the mechanics of the body which determine efficiency and third to present a simplified and practical method of teaching which can be carried out in regular office practice and which has produced highly satisfactory results in my hands over a period of several years.

Efficient use of the body has so evidently a favorable effect on the general health and well being that it is accepted as an axiomatic point of departure by most writers on the subject. The bad effect of poor general health on body mechanics, with its attendant lack of muscle tone, lowered threshold of fatigue and lessened available mechanical and emotional energy, is also evident. It seems unnecessary to argue that poor body mechanics and ill health form a truly vicious circle, each in turn increasing the other.

The body, like any other machine, can be mechanically efficient only when all its parts can be most readily maintained in equilibrium. "Equilibrium maintained by the body in upright standing position is an active and not a passive one."[1] The starting point for efficient, graceful, strong movement must be equilibrium. Energy

Owing to lack of space, the illustrations have been omitted here. They will appear in the author's reprints.

Read before the Section on Pediatrics at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.

1. Phelps, Morgan Winthrop, and Kiphuth, Robert J. H.: The Diagnosis and Treatment of Postural Defects, Springfield, Ill., Charles C. Thomas, Publisher, 1932. (*a*) p. 68; (*b*) p. 71; (*c*) p. 111; (*d*) p. 16; (*e*) p. 15; (*f*) p. 120; (*g*) p. 148; (*h*) p. 76; (*i*) p. 149; (*j*) p. 30.

used to maintain a too unstable active equilibrium is wasted and must therefore be subtracted from that available for physical activity and for nervous stability. Only in the fully erect posture (upright equilibrium) is full expansion of the lungs possible. Goldthwait [1a] has pointed out that the viscera are slung from the cervical fascia, by way of the attachment of the pericardium to the diaphragm and the diaphragmatic attachment of the abdominal viscera. Only when the dorsal and cervical portions of the spine are fully extended are the viscera raised to the highest possible (best functional) level. "The position of greatest economy, which at the same time allows fullest play of the shoulder girdle and arm muscles, is therefore the fully erect position with the neck line perpendicular and chest somewhat elevated. The dorsal erector spinae as well as the cervical muscles can hold with greatest firmness when summation of their pull is—a straight line." [1b] When faults in body mechanics become sufficiently great the stress produced causes pain, but long before the threshold of pain is reached the nervous system is irritated to a highly unfavorable degree. On the contrary, a balanced erect carriage, easily attained only after faults in muscle balance have been corrected, eliminates the irritating reflexes of strain. Heads up! affects the emotional as well as the physical level, and man's erect posture as well as his brain and his hands has no doubt assisted him in attaining his dominant place among the creatures of the earth.

A clear understanding of the mechanics of the human body in rest and in motion must rest on certain fundamental principles:

1. The body is subject to the laws of gravity, and maintenance of good posture with the least muscular effort demands that the body be arranged, as nearly as possible, symmetrically about a vertical line passing through the body's center of gravity. In other words, to maintain the upright posture each part of the body must be counterbalanced by another part with an equal moment of force (moment of force: mass × horizontal distance from center of rotation) or by muscular contraction sufficient to balance the inequality. This indicates clearly that when, for any reason, some part of the body is extended too far from the center of gravity in a horizontal direction another part will be extended too far in the opposite horizontal direction to restore balance, adjusted by the semicircular canals to maintain the visual plane parallel to the earth's surface.

2. All skeletal muscles are arranged in pairs as antagonists; i. e., for every flexor there is a corresponding extensor. These antagonistic muscles are at rest only when they are simultaneously relaxed, which is possible only when the part which they move or support is in equilibrium. Any muscle which has the linear distance between its origin and insertion shortened takes up the slack thus allowed and increases both in cross-section and strength, while any increase in length or stretching produces a corresponding decrease in strength, with a corresponding decrease in cross-section. In general the strength of a muscle varies directly with its cross-section and indirectly with its length. Any advantage which a muscle gains over its opponent increases steadily—the strong muscle gains and the weak muscle loses strength—thereby increasing the departure from equilibrium, with the production of increasing deformity. Certain muscles, because of their great strength and because they are shortened when the body is in a habitual incomplete upright posture, in a long continued sitting posture, especially if slumping is added, or in an incorrect lying posture, are most frequently able to gain and increase their advantage over their opponents. In general, these are the muscles which were of greatest use when our ancestors traveled on all fours and those which must exert the most force in maintaining the active equilibrium of the body in the present upright posture. The psoas and pectoral muscles are an example of the first group and the gastrocnemius of the second.

3. All deformities, with the exception of those apparent ones which represent a stage of development in the growing child, tend to increase. The reasons for this increase are as follows: The deformity allows the shortening and therefore the gain in strength of muscles over their opponents; growth takes place in the direction of use (Wolff's law [1c]); any posture or method of movement tends to become implanted in the kinesthetic sense as a habit; generally it is easier and more comfortable to rest and move with a deformity than against it toward correction, and in the young, growing child, with his elastic tissues and his great skill for learning new, substitute stances and movements, deformities, even though considerable, rarely cause sufficient discomfort to make their correction mandatory.

4. Ontogeny recapitulates phylogeny in the development of body mechanics as truly as in other aspects of growth and development. Every child must learn to sit up, to stand upright and to walk and run as a biped. His level of skill may stop at any of the stages leading toward perfection in these skills as truly as it may in music or mathematics. Beethoven's Fifth Symphony is not for beginners, and higher mathematics does not yield to the multiplication tables alone.

As in all other development of the human being, heredity and environment have the principle rôles. Heredity determines the quality of the body with which he begins life and the energy or "spirit" which will give him the urge "to strive forward toward perfection in all things," while environment contributes the conditions which will aid him in his upward struggle or place obstacles in his path. The ideal environment is that which enables him to make the most of his hereditary possibilities. Skill in standing, walking, running, sitting and relaxation, all of which are so useful in everyday living and a lack of which allows so much injury to the body, surely is of sufficient importance to warrant one's best efforts as teachers of parents and children.

That pediatricians and other physicians are interested in the body mechanics of children is evident from the number who prescribe some form of corrective shoe for many of their patients. This interest, with unfortunately its attendant prescribing, has spread like a contagion to teachers of physical education, manufacturers and even salesmen of shoes. A salesman in my community to whom I formerly sent many children because he sold good shoes and fitted them well has recently been telling mothers that he knows as much about feet and legs as any one in the world.

Every physician who cares for children should be interested in their feet. He should teach mothers that short socks and short, ill fitting shoes may cause irreparable damage to growing, easily deformed feet; that children under 7 years of age rarely, if ever, complain of short shoes but walk with the feet everted and pronated to relieve their toes from pressure,[2] thus forcing the feet to bear the weight of the body too far mesially on the inner borders of the heels and on the first meta-

2. Sweet, Clifford: The Postural Development of Infants with Special Reference to the Development of the Function of Walking and Proper Shoeing, California & West. Med. **25**: 181 (Aug.) 1926.

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tarsal bone, while nature designed the feet to bear weight centrally on the heel and only slightly more on the first metatarsal bone than on the fifth; that with the feet thus forced into eversion and pronation not only is it impossible to use the full grasping powers of the feet in walking but the foot in this position must take off over the head of the first metatarsal bone instead of over all the toes.[2] Shoes with soles so rigid that the child cannot bend them force him to take off in a similar though somewhat less pronounced manner and so contribute to the very deformities they are designed to correct, i. e., eversion and pronation.[2] The arch of the shoe and the arch of the foot should be of exactly the same length; otherwise the foot and the shoe do not "hinge" together in walking and the plane of weight bearing (a plane is determined by three points) of the foot and the shoe do not coincide, forcing the foot to make internal adjustment, with resultant strain. All shoes should be built on combination lasts, since all children have combination feet, with greater width in the forefoot than in the heel. If the child has an unusually narrow heel, one can make the shoe grasp it more firmly by cementing one or more layers of leather within the counter.

However, while every effort should be made to protect the feet from deformity and while it is true that the mechanics of the standing or walking body cannot be correct when the feet are not functioning correctly, it is necessary to realize that the feet only partly control and to a greater extent are controlled by and merely reflect the mechanics of the body as a whole in its relationship to gravity and the earth's surface. According to Steindler,[3] in pathologic types of posture the deflection of the line of gravity in relation to the spine persists and results in abnormal relations to sacro-iliac, hip and knee joints, balance being ultimately recovered by the position of the feet. Therefore, while correction of the position of the feet alone has value, it is not effective as a solution of the whole problem of body mechanics. To approach the problem with sole or undue emphasis on the feet is to attack it where its ill effects are most obvious rather than where its causes can be most readily altered. Correction of the feet alone is a partial and incomplete solution because its effect is not sufficient to correct the entire body, especially in the young child, whose elastic and readily molded tissues can completely take up the entire correction in nearby structures, with the result that too small an effect is made on the body as a whole. Failure to realize that this method of attack is superficial and concentrated on only one part of a general problem all too often causes both physician and parent to dismiss the entire matter with the thought, "Oh well, I've done my duty; I've wedged his shoes," with ultimate harmful results to the child.

Any attempt to understand the body mechanics of the growing child must be based on a thorough knowledge of the stages of growth and development through which, with minor variations, all normal persons pass between birth and adult life. The mechanics of the body must at each succeeding stage be interpreted according to the age and the level of growth and development which the individual child has reached. Observation of this progression is peculiarly the privilege of the pediatrician, because he alone sees large numbers of normal children over a period of years during which growth is rapid.

Every baby has bowed legs[4] which will straighten in due time after he begins to walk unless he is allowed to have rickets, is deformed congenitally or by disease, is injured, or is one of those rare persons who through inheritance have an unusual form of leg structure. When I first wrote that all babies have bowed legs, I thought it was the result of the child's position during intra-uterine life. While bowing is established before birth, it is increased or at least maintained until after upright weight bearing begins by the baby's frequent strong plantar flexion of the feet while in full supination (fig. 1), during which the muscles produce an outward thrust on the shaft of the tibias. Most people, I am sure, have noticed a baby's feet assume this position when he stiffens his body to cry or when, with delighted anticipation, he is waiting to be picked up. The comparatively strong grasping power of the baby's foot represents, I am certain, a stage of development which his tree-dwelling ancestors retained and the use of which in all probability made them permanently bowlegged. In that far off time ideals of manly beauty and feminine pulchritude no doubt demanded properly bowed legs, not to speak of the added safety when aloft afforded by an extra strong foot grasp. The Greek ideal of beauty, especially as shown in their statues of athletes, included a definite symmetrical out-bowing of the tibias. During the months when the child is increasing or maintaining the bowing of his legs he is at the same time shortening and strengthening the gastrocnemii, the external rotators of the thighs and, to some extent at least, the glutei, preparing them for their important rôles in the new adventure of standing upright, which is just ahead.

When the child first stands, stability is his first and only desire.[4] To gain in stable weight-bearing ability his feet must give up something of their grasping power; at first the grasping power is made completely subservient, in that it is used only in the component parts which contribute to stability. After a stable stance has become habitual and easily maintained and walking has progressed beyond the toddle of the infant, the grasping power again rises in importance, to play an important part in the use of the feet as organs of locomotion.

This double function of the feet, that is, weight bearing and taking an active part in locomotion, with weight bearing necessarily appearing first and being of greater importance throughout life, seems to me to explain the physiologic changes which take place from the time the child learns to stand until he is about 6 years of age. In order that he may stand, at first, the feet must make as stable a contact with the earth as possible. The base is broadened by placing the feet widely apart in eversion, thus giving enough lateral stability so that an infant rarely falls laterally. But eversion also makes pronation easier and, since the heel is narrow, added stability is gained by further pronation, until the entire ball of the foot comes firmly in contact with the earth. Furthermore, when the gripping action of the feet is used with the feet parallel, the inner borders are raised, while with the feet everted pronation takes place during gripping, and any increase in the distance between the everted feet forces them into greater pronation. When the child first stands he is unable to use full extension of any of his joints because when he does his center of gravity rises so high and is thrown so far forward that he falls face downward.

3. Steindler, Arthur: Mechanics of Normal and Pathological Locomotion in Man, Springfield, Ill., Charles C. Thomas, Publisher, 1935.

4. Sweet, Clifford; Watson, R. G., Stafford, H. E.: Physiologic Changes in Posture During the First Six Years of Life, J. A. M. A. **91**: 1519 (Nov. 7) 1928.

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Without full extension of the knee, the foot gains no support for its inner border from the tibialis anticus and posticus, while the gastrocnemii must contract strongly to help maintain the upright posture, thus laying the foundation for the powerful, short, overacting gastrocnemius muscles which are one of the obstacles to be overcome when one is correcting faulty posture in older children. The wide stance of the feet with incomplete extension of the hip joints locks the femur in internal rotation, thus further contributing to the concentration of weight on the inner borders of the feet.

Since any postural tendency is progressive until some force successfully opposes it, the internal rotation of the femurs, the outward rotation of the tibias and the pronation of the feet increase normally until the child is 3 years old. All children at the age of 3 are knock kneed and have associated pronation of the feet. During the first three years the tibias have lost their bowing because of weight bearing and because they are no longer subjected to the muscle pull previously mentioned. Throughout these years the child's weight increases faster than does his ability to carry it advantageously, thus keeping an overemphasis on the weight-bearing function of the supporting structures of the body, with an increasing tendency to continuation of the postural force lines then existing.

Gradually the process reverses itself: Growth slows up, relative strength increases and coordination and physical activity increase to the point where weight bearing becomes more nearly equaled in importance by skilful movement. Now antagonistic muscles come more evenly into play; the protuberant abdomen flattens, and the muscles of the abdominal wall are strengthened; the glutei develop rapidly, lessening the forward inclination of the pelvis, and in turn the external rotators of the thigh shorten, with distinct outward rotation of the femur and less eversion of the feet, so that at about the age of 6 years knock knees have become straight and pronation has greatly decreased.

Therefore I cannot agree with Phelps [14] that the pronation seen in the feet of all preschool children is environmental. If it were due to environment there would be more exceptions than there are; and, incidentally, the only notable exceptions that I have seen have been small, underweight children who for some reason other than lack of proper food, such as congenital heart disease, grew very slowly. This observation seems to bear out my idea of the close relationship between rapidly increasing weight and the normal posture of preschool children. Neither can I agree that the deformities of the feet during the preschool age are contributed to adult posture, except as they remain the most obvious result of childhood posture which has not been changed far enough toward the best obtainable adult posture.

Certainly all children do not need to wear corrective shoes, any more than all children should wear shoulder braces while the round upper part of the back is normal or an abdominal support during the stage of infancy when the abdomen is naturally protuberant. As Phelps says so well, [16] "Shoulder braces and abdominal supports should not be used for prevention because muscles which are too long supported do not develop." I see no logical reason for not applying the same teaching to the feet. Corrective shoes should be worn only to correct a definite intrinsic deformity and should be discarded as soon as possible. The greatest care should be taken to prevent any interference with the function of the foot while it is held in correction. If a shoe which compels the child to stand with his feet in the ideal weight-bearing position is so rigidly constructed that the feet cannot be used normally in walking and running, the net result is harmful to the child. Again, if the foot fault is not intrinsic but is a compensation for imbalance in another part of the body, unless that imbalance is of minor degree correction of the feet alone will accomplish little. For example, if the feet are pronated because of the pull of short calf muscles, correcting the pronation of the feet alone will not stretch the calf muscles sufficiently and will affect general body mechanics very little; if pronation is a result of long, weak calf muscles, correction must be aimed primarily at shortening these muscles if it is to accomplish its purpose, and in older children this correction must be supplemented by the correction of mechanical faults in the entire body.

"The knowledge of correct posture and body mechanics can and should become a part of the daily life. . . . It is only in this way that any scheme or branch of physical education can justify its purpose." [17] To bring about this highly desirable condition among his patients, the physician must have (1) a clear, definite idea of the best posture and use of the body which can be attained, (2) a clear understanding of the obstacles within the body as well as those of environment which must be overcome if large numbers of children are to arrive as nearly as possible within the ideal state, (3) a sound simplified method of teaching which can be understood by parents and children and which for practical purposes is not too time consuming to be used in office practice.

Among the children whom I see I rarely find one whose idea of posture is not a strained unnatural position to be assumed for a short time while he is undergoing inspection. When he is asked to stand, the inner borders of the feet are clamped together or turned out and the influence of the military posture is shown very evidently in the retraction of the shoulders without any attempt to correct the back, with only a partial correction of the position of the head and with little or no attempt to change the inclination of the pelvis. The military posture is not a normal posture but only an incidental upright posture designed for quick starting.

The ideal upright posture is (1) feet parallel at a comfortable distance apart with the weight voluntarily shifted toward the fifth metatarsal bone if pronation is marked, (2) the pelvis rotated anteriorly, (3) full extension of the dorsal and cervical portions of the spine, with consequent elevation of the chest and the head, and (4) the weight carried slightly forward (fig. 2).

The assumption of this standing posture demands effort only for the placing of the feet, the rotation of the pelvis, the elevation of the head and the shift of the body weight forward. With the feet so placed and the weight of the body forward, rotation of the pelvis automatically fully extends both hips and knees, rotates the thighs laterally, decreases lumbar lordosis and allows the lower part of the abdomen to flatten. It is easier to rotate the pelvis with the weight thrown backward, but in this position the knees are flexed because of the strain thrown on the iliofemoral ligaments. In turn, reduction of the lumbar lordosis causes a compensating reduction of the dorsal kyphosis. Elevation of the head to its full height completes the extension of the dorsal and cervical portions of the spine, with consequent elevation of the thoracic cage. Much the

same result can be obtained by contraction of the abdominal muscles and elevation of the chest, but when this is done the position can be maintained only with great effort, breathing is interfered with and elevation of the thoracic cage tends to throw the center of gravity forward, with a consequent increase in lumbar lordosis. When a child first attempts to stand in correct upright posture the position is strained and awkward, but it becomes increasingly easy and comfortable as the faults in posture are corrected.

Besides the ease with which this posture can be taught because of its simplicity, it has the very great advantage of being easily carried over into walking, running and sitting. The muscles which rotate the pelvis anteriorly cannot be held taut when one is walking but, having been strengthened and shortened in correct standing, they tend to hold the pelvis in anterior rotation and, when one is walking correctly, that is, with the feet pointed forward and the head carried to its full height, these muscles, of which the glutei are the most important, are contracted strongly with each step and so automatically strengthened. On the other hand, walking with the feet everted causes the leg to be swung forward from the hip with little or no action on the part of the glutei, and in consequence development lags. Walking and running should differ only in length and cadence of stride. When the head is held at its greatest possible height by a fully extended cervical part of the spine, the sitting posture cannot be other than correct.

The obstacles which most commonly must be overcome before the complete upright posture can be attained are (1) short calf muscles or, occasionally, too long calf muscles, (2) short hamstring muscles (biceps, semimembranosus, semitendinosus), (3) weak, undeveloped external rotators of the thigh, (4) weak, underdeveloped glutei, (5) weak, undeveloped muscles of the abdominal wall, (6) strong, overdeveloped erector spinae muscles in the lumbar region and correspondingly weakened members in the dorsal region, (7) strong, short, overdeveloped anterior shoulder girdle muscles and (8) forward thrust of the head, with shortening of the upper trapezius and splenii muscles. Much can be done to prevent these deformities in young children, and they can be corrected or greatly reduced in nearly if not all normal children later in childhood.

In the hurry and bustle of modern life many children are spending too much time in the upright position. Fatigue always causes the child to slump in the posture with the lowest possible center of gravity. When this faulty posture is noticed, all too often a dancing class is added to his already too large burden of activities. Some one may notice the pronation of feet and prescribe corrective shoes which interfere with the function of his feet. He may have an acute illness and, while not yet fully recovered, he may become a victim of fatigue or some muscles may gain an advantage over their weaker opponents. His bed may not be flat and firm, forcing him to sleep in a posture that shortens some muscles and stretches others. His chair may be too deep and too high, so that when he sits in it the weight of his dangling legs pulls his shoulder girdle forward and thrusts his head forward. His teacher of physical education and his parents may still have the military posture in mind and be constantly saying "Stand up! Sit up! Throw your shoulders back!" A child should not be told to stand up without being taught to do it any more than he should be ordered to do his arithmetic without preliminary instruction in fundamentals.

The ideal adult posture is one which is completely upright. Man's upright posture has developed from that of the quadruped. The posture of childhood is not a static one but is changing from year to year, moving constantly toward the adult or completely upright type. The progress of the child toward the best development possible in adult life is based on his hereditary, racial and individual characteristics and on the modifications which the sum of environmental forces can produce.

Mechanically, the greatest and most fundamental change which takes place in the process of evolution from quadruped to biped is the rotation of the pelvis which must take place to allow full extension of the hindlegs. The assumption of the upright posture and consequent freeing of the forelegs from weight bearing has permitted profound changes in their function. The greatest evolution in the functions and development of muscles has been in those associated most directly with the changed angular relationship of the pelvis to the legs and spine.

Consequently, any attempt to train the child to assume the complete upright posture must make the ability to rotate the pelvis anteriorly its first and most fundamental object. When the pelvis is not in full anterior rotation the fully erect posture cannot be attained except by means of exaggerated, mutually compensating curves of the spinal column and malposition of the legs and feet. Conversely, when full anterior rotation of the pelvis has been made possible and has become habitual by stretching of the opposing short muscles and strengthening of the assisting weak muscles and the necessary poise has reached fixation in habit, complete upright stance and balanced muscular movement are natural consequences. As a matter of course, stretching, strengthening and training in poise must be extended to all parts of the body to make it possible for the entire body to reach upright equilibrium. For example, short anterior muscles of the shoulder girdle must be stretched sufficiently to allow the shoulder girdle to gravitate posteriorly into balance above the anteriorly rotated pelvis. Weak posterior muscles of the shoulder girdle must be strengthened to prevent the shoulder girdle from falling forward in fatigue to force the pelvis back into posterior rotation to maintain balance.

The great number of normal children need no attention to their body mechanics during the preschool years, except that they must be properly fed and protected during and after acute illness and that no mechanical force, such as that supplied by shoes, bed and chair and especially by overfatigue, must be allowed to interfere with normal development. However, even during these years many children need help which can be given most effectively and economically at this time in the child's life. Nasal obstruction interferes with the development of the thorax and should be remedied as soon as it is apparent by removal of the adenoid growth and relief of allergic rhinitis. Malocclusion of the jaws that evidently interferes with mastication or breathing should be corrected by the orthodontist even though some further correction may be needed after the permanent teeth are in. An attempt should be made to strengthen the muscles of the abdominal wall if they appear to be underdeveloped and especially if wide separation of the recti is present. This is best done by encouraging the child to play at the game of pulling himself into a sitting position without the assistance of the arms, from a supine position on a firm flat surface, with his legs widely separated and held firmly

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against the supporting surface by an adult. The wide separation of the legs is important in that it prevents the psoas muscles from pulling in a straight line and makes stronger contraction of the muscles of the abdominal wall necessary (fig. 3).

Certain infants who walk late and stand with the feet in extreme pronation and eversion have such long calf muscles that the feet can be dorsiflexed far beyond the normal angle, often until the dorsum of the foot is brought almost into contact with the anterior surface of the leg. These children begin walking very soon after being fitted with shoes having heels of suitable height, usually from one-half to three-fourths inch, and in time the calf muscles shorten sufficiently to correct the pronation (fig. 4). The shoes for this purpose must have sufficient rigidity to stabilize the heel but should not be so inflexible that the foot cannot "hinge" and grasp easily during walking. Elevation and advancement of the inner borders of the heels lessens pronation and eversion of the feet, but the height of the heel prescribed is far more important. Elevation or wedging of the inner borders of the soles interferes so seriously with the flexibility and grasping power of the foot that it is mentioned only to be condemned.

Certain other children early in life show a tendency to too great shortening of the calf group. Aside from their hereditary tendency, this is brought about by the extra work thrown on these muscles when a poor habitual upright posture continually keeps the center of gravity of the body too far forward. The tendency toward the shortening of these muscles is normally opposed by the force exerted by the plantar flexors of the feet, but this opposition is interfered with too frequently by short or rigid shoes or is not developed because too little walking is done. Often the feet of these children show early but unmistakable signs of becoming the rigid claw or pes cavus type of later life; no other type of deformity of the foot can produce so much human misery. Often the child with this type of foot has been complimented in classes in physical education because of his "wonderful arches" even though his contracted toes, flattened anterior transverse arches and inability to dorsiflex or extend the foot are already too apparent.

If deformity is not advanced it may be corrected by the removal of such obstacles as incorrect shoes and by manual stretching of the calf muscles and plantar tendons and fascia, supplemented by stretching exercises and the natural corrective value of full function. Correction is made more rapid and certain, if the deformity is advanced, by fastening a cleat, usually about one-half inch (1 cm.) in height, across the sole of the shoes directly beneath the metatarsal heads, so that with each step calf muscles and plantar structures are stretched (fig. 5). It is well to remember that the calf muscles are too short unless the foot can be dorsiflexed to at least a right angle and ideally through an additional fifteen degrees.[1j]

From the beginning one should let nothing interfere with the child's learning to stand and walk with the feet parallel. Then if, with full freedom, he walks or stands with his feet everted, his muscle balance should be studied and corrective measures and teaching begun.

During the earlier school years the normal healthy child needs only good nutrition, protection from fatigue, prohibition of the injunction "Shoulders back," a seat in which he can sit with the feet planted squarely on the floor, a firm, flat bed and sufficient freedom to make full use of his great store of physical energy. I am convinced that children should not attend school more than a half day until the fourth grade is reached. Not only should the school desk be of the proper height, but the spacing between the desk and the seat should be such that the child can lean forward from the hips instead of dropping the head and shoulder girdle forward when working.

While the gluteal muscles develop steadily when walking is done with the feet parallel, they are seldom equal in strength or development to their principal opponents, the psoas muscles. Since the complete anterior rotation of the pelvis requires a strong muscular pull, principally by the glutei, and since incomplete rotation can be and is commonly compensated for by increased lumbar lordosis, which allows shortening and therefore further strengthening of the psoas muscles, there is a natural reason for this inequality to persist and increase. Therefore, any exercise which will teach the child to rotate the pelvis anteriorly and so strengthen the glutei will prevent excessive lumbar lordosis and correct it after it has already become established. Phelps warned against reversing the lumbar curve as a result of extreme abdominal and gluteal contraction.[1g] However, I have seen no evidence of this overcorrection in children. I think it can be avoided by depending entirely on the spontaneous contraction of the abdominal muscles which takes place when the pelvis is rotated anteriorly and the chest is lifted and by being careful that the center of gravity of the body is well forward when the pelvis is actively rotated. He has observed correctly that it is easier to flatten the lumbar curve with the weight displaced backward, but complete extension of the knees is then impossible.[1h] Study of his figures shows the backward displacement of the center of gravity and the flexion of the knees without which in children I have not been able to flatten completely the lumbar curve.[1i] Some children when told to contract the glutei hyperextend the knees (back knee), and one must guard against this by insisting that the weight of the body be forward sufficiently without forward bending at the hips to make such hyperextension impossible against the resistance which is then offered by the quadriceps muscles. I know of no objection to making anterior rotation of the pelvis by contraction of the glutei the foundation of the early lesson which the child is given in body mechanics. I have found playing the game of putting a wooden tongue blade in the gluteal fold of the child and teaching him to grasp it firmly by narrowing the fold an excellent way in which to begin this instruction. If the child has difficulty in learning to contract the glutei it is well to do it first while he is lying prone and later when he is standing.

Complete anterior rotation of the pelvis cannot be accomplished with simultaneous full extension of the hips and knees against the resistance offered by too short hamstring and calf muscles. Stretching of the calf muscles has been described. An effective method of stretching the hamstring muscles is, having assumed the correct standing posture, with emphasis on gluteal contraction, to bend forward from the hips, keeping the back flat, in an attempt to reach the floor with the finger tips. If the back is kept flat there is no strain on the lumbar or the sacro-iliac portion of the spine and the weight of the upper part of the body and the head acts effectively to stretch the hamstring muscles. Unless there is marked disproportion between the respective lengths of the legs and the body, the stretching is usually sufficient when the child is able to touch the

floor with the finger tips without bending the knees or elevating the heels from the floor.

After the feet, legs, pelvis and the lower part of the spine are in balance, correction of the position of the head completes the correct alinement of the body. When not prevented by shortened muscles, the upper part of the spine, the thorax and the upper part of the abdomen will follow the fully extended head up without conscious effort, leaving the full respiratory excursion of the chest unhampered and allowing the shoulder girdle and arms full freedom of movement as well as making possible the most advantageous use of their entire strength. As the chest rises the upper part of the abdomen flattens, the lower part having flattened with the anterior rotation of the pelvis; the dorsal kyphosis flattens in response to the lessening of the lumbar lordosis of the spine; the shoulder girdle rotates posteriorly into balance over the anteriorly rotated pelvis, and lordosis of the cervical part of the spine is practically obliterated.

The correct position of the head is the most difficult to teach, and faulty position of the head, with excessive cervical lordosis, often remains long after other faults are remedied. I have had more success with the method described by Haynes than with others I have tried.[5] His method is to have the patient drop the head backward as far as possible and then revolve it up into full extension about an imaginary axis passed through the head from ear to ear. Resistance to full extension is offered principally by contraction of the anterior muscles of the shoulder girdle and shortening of the muscles which pull the head backward (upper trapezius, splenii and sternocleidomastoid).

The best single exercise that I know of to stretch the anterior muscles of the shoulder girdle, strengthen the posterior muscles and accomplish the same result in the neck is as follows: Lie prone on a firm surface with the head extended so that the forehead rests firmly on the supporting surface; clasp the hands together over the buttocks and draw the scapulae as near together as possible toward the midline; holding the scapulae firmly fixed and being careful not to rotate the head backward, raise the head and trunk as far as possible dorsally (figs. 6 and 7).

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SUMMARY

Body mechanics should have a prominent place in preventive pediatrics. The pediatrician has opportunity to see large numbers of normal children during the years of growth. The problems of body mechanics cannot be solved by a single formula, such as wedging the child's shoes, but must be considered on the basis of the mechanics of the entire body modified to fit the needs of the individual child.

The ideal upright posture is the one in which the body is arranged about a perpendicular line through its center of gravity so that the least possible muscular activity is needed to maintain it. The fully upright posture can be attained only when rotation of the pelvis from the position of the quadruped to that of the biped is complete.

The upright posture of the child is not so far removed from that of the quadruped as is that of the adult. Within certain stages of development during childhood pronated feet, bowed legs, knock knees, anterior rotation of the pelvis and other mechanical relationships are normal, representing a stage of progress toward the adult posture. None of these stages of development should be considered abnormal unless they are not spontaneously corrected within the age limit to which they belong, and no method of correction should interfere with the development of the function of the entire body as a unit.

Children can be taught to use correct posture when standing, walking or sitting by correcting the position of the feet, rotating the pelvis anteriorly and extending the head to its full height. Emphasis on these three points alone produces excellent results. When certain muscles have become too strong and short, while their opponents are weakened and stretched, the correct exercises will stretch and strengthen them.

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5. Haynes, Royal Storrs, New York: Personal communication to the author.

ABSTRACT OF DISCUSSION

DR. LLOYD T. BROWN, Boston: There are two points I want to emphasize: first, the recognition and, second, the treatment of postural deformities. To recognize a deformity, one must have a standard for comparison. I question whether any two pediatricians could agree on what is the normal or perfect child, and the reason for this is that no two children are ever built the same, and also what seems to be normal for a child at one age is not normal for the same child at another age. There are four points which are important in judging the body mechanics of a child or an adult. These are that: 1. There should be no exaggerated curves of the spine; the body should be as tall as possible without strain. The pelvis should be rotated anteriorly to reduce the lumbar curve. 2. The angle of the ribs just below the breast bone should be as near a right angle as possible. 3. The natural chest girth at the lower end of the breast bone should be about half way between the full inspiration chest girth and the full expiration chest girth. 4. The upper part of the abdomen, the epigastrium, should be well developed and larger and more prominent than the lower part, which should be flat below the umbilicus. There are, of course, many other things which can be looked for, but it has been found that, if these four conditions are complied with, good body mechanics is present. It has also been found that although a child may be able to assume an excellent posture while the examination is being done, and yet have a very poor habitual posture, one or more of the foregoing conditions will not be present. As for the treatment, this begins with the education of the child and the parents. He should be taught how to put his body in the position of good body mechanics and that the taking of this position should be a part of his daily work, such as in his recitations and in going from class to class. If he cannot assume such a position, he should be taught it in special classes, just as he is taught any other subject in which he is deficient. The position of good body mechanics cannot be taken without using every muscle of the body, and if this position is taken often enough, not only will the muscles be exercised but there will gradually be produced the habit of good body mechanics. I want especially to emphasize, the importance of every physician training his eye to recognize good or bad body mechanics and not to fall back on the excuse that because practically every child he sees has faulty body mechanics it is normal for children; and, second, that it is our duty as physicians to see that our schools give as good an education to the bodies of our children as they try to do to their minds.

DR. WINTHROP M. PHELPS, Baltimore: I think the most important point that Dr. Sweet has brought out is the fact that in children of different ages there are postures which are characteristic for each of those ages. This is, of course, true, especially in younger children, and in very small children who have only just started to walk. There is not only the change from the lying down position to the erect position but the difference in diet of the child, which brings about a difference in the size of the abdomen. The young child's diet is to a large degree liquid, and there has to be space for this liquid. When a child is older and the diet becomes less bulky, it is much simpler to maintain a flatter abdomen. If one tries to flatten the abdomen of a baby of 2, it simply bulges at the sides. There is therefore no point in attempting to expect that child to have a flat abdomen. In other words, children should

never be judged by adult postural standards. A second important point, I think, is the difference in the length of ligaments. In some children it is possible to bend the thumb back until it touches the arm. That is, of course, evidence of long ligaments in the wrist. It is usually, but not always, true that the ligaments all over the body are either all long or all short. The child with the long ligaments, when he sags, sags farther than the child with short ligaments; hence his posture looks much worse. There are some advantages in long ligaments, in that broken bones and sprains are less common. The child who apparently stands very badly, if he is healthy, is not necessarily a child with any worse fundamental posture than another child with short ligaments who appears to stand very well. Dr. Sweet's paper is important and should be utilized in pediatric practice to a great extent.

DR. CLIFFORD D. SWEET, Oakland, Calif.: I feel that I take a somewhat unfair advantage of my discussants in a paper of this sort in that I have sent them a paper that is so long that I couldn't possibly present it all here. It is almost impossible to present this sort of subject. I have been mulling it over in my mind for several years, and because I found it so difficult to present I put off doing it. What I have told you here, and what I am telling you in my exhibit, are the things I have worked out in practice and in teaching interns and residents. I think it cannot be neglected without doing detriment to the child. It is not a matter for which one can learn a quick and easy formula. It is something that, if given thought and study, will become increasingly more interesting, and it will enable a physician to be of real service to many children.

THE ACTION OF SULFANILAMIDE IN RHEUMATIC FEVER

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The hypothesis that hemolytic streptococci have an etiologic role in many cases of rheumatic fever makes it highly desirable to determine the action of sulfanilamide in this disease. In undertaking this study, however, we understood that it might not be possible to evaluate its action with the same criteria that have been applied in using it in the treatment of such diseases as streptococcic bacteremia, meningitis or erysipelas, for if streptococci are indeed the causative agents in rheumatic fever they seem to act in a more complicated manner than as simple infectious agents. The present study therefore has theoretical as well as practical implications.

The literature has few references to this subject. Klee and Römer [1] observed a patient with acute polyarthritis and endocarditis who was treated with massive doses of prontosil and "cured" in eight weeks. They also observed some patients with acute polyarthritis who did not respond to salicylate and aminopyrine therapy but improved when given the disodium salt of 4-sulfamidophenyl-2'-azo-7'-acetylamino-1'-hydroxynaphthalene-3',6'-disulfonic acid (prontosil); but no favorable effect of this drug was noted in chronic arthritis, even of a secondary nature. Massell [2] found no beneficial effect from prontosil in two patients with frank rheumatic fever or in two others with chorea. Six rheumatic subjects who contracted hemolytic streptococcus infections were given this drug in an attempt to prevent recurrence of rheumatic fever, but the disease developed in two and one died. The same number of relapses occurred in six control patients, who were not treated with the drug. Peters and Havard [3] compared the complications in 150 patients with scarlet fever treated with parabenzylamino-benzene-sulfonamide with those in a like number of patients not so treated (fifty of the latter had serum). Endocarditis developed in three of the first group, compared with nine of the second; in three of the first and ten of the second group rheumatism developed. There is no report of the action of this drug after the development of rheumatic symptoms.

The low toxicity of prontosil and sulfanilamide for laboratory animals has not been altogether paralleled in man, and there is a growing list of cases of severe and even serious drug intoxication. Most patients have some degree of gastric disturbance, running the gamut from "indigestion" [4] to anorexia, nausea and vomiting. Three fourths of a large series of patients observed by Long and Bliss [4] had cyanosis. In some instances this is due to sulfhemoglobinemia [5] and in others to methemoglobinemia,[4] but often its cause is undetermined.[6] All patients taking therapeutic doses of the drug probably have some degree of acidosis, although it is not usually severe enough to be detected clinically.[7] Both prontosil and sulfanilamide have definite fever-inducing capacities,[4] and both at times have a toxic action on the blood or blood-forming organs. Massell [2] and Plumer [8] both observed cases of leukopenia, and Harvey and Janeway [9] carefully studied three cases in which acute hemolytic anemia was apparently induced by these drugs. They stated that the hepatic function is depressed, as shown by the bromsulfalein test. Most authors agree that the kidney is relatively little if at all affected, but in one of our patients, to be described, suppression of urine, then albuminuria and cylindruria followed severe intoxication with sulfanilamide.

While the severe infections for which the drug was first employed may have been accessory factors in the intoxication, the warning of Reuter [10] concerning the probable harmful action of the drug has been amply justified in the number of severe toxic symptoms that have recently been recorded in patients with such mild diseases as simple gonococcic urethritis.[11]

From the Hospital of the Rockefeller Institute for Medical Research.

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9. Harvey, A. M., and Janeway, C. A.: The Development of Acute Hemolytic Anemia During the Administration of Sulfanilamide (Para-Aminobenzenesulfonamide), J. A. M. A. **109:** 12 (July 3) 1937.

10. Reuter, F. A.: The Use of Sulfanilamide in the Treatment of Gonorrhea: Report of Results in One Hundred Cases. M. Ann. District of Columbia **6:** 117 (May) 1937.

11. Among the toxic symptoms recorded are those reported in THE JOURNAL for Sept. 25, 1937:
Kohn, S. E.: Acute Hemolytic Anemia During Treatment with Sulfanilamide, p. 1005.
Bucy, P. C.: Toxic Optic Neuritis Resulting from Sulfanilamide, p. 1007.
Menville, J. G., and Archinard, J. J.: Skin Eruptions in Patients Receiving Sulfanilamide, p. 1008.
Goodman, M. H., and Levy, C. S.: The Development of a Cutaneous Eruption (Toxicodermatosis) During the Administration of Sulfanilamide: Report of Two Cases, p. 1009.
Frank, L. J.: Dermatitis from Sulfanilamide, p. 1011.
Schonberg, I. L.: Purpuric and Scarlatiniform Eruption Following Sulfanilamide, p. 1035.
Newman, B. A., and Sharlit, Herman: Sulfanilamide: A Photosensitizing Agent of the Skin, p. 1036.
Salvin, Monte: Hypersensitivity to Sulfanilamide, p. 1038.

METHOD

Because rheumatic fever varies widely in duration, intensity and clinical course, the evaluation of therapeutic measures is extremely difficult, especially if they appear to be beneficial; hence in the present study we selected only patients from whom a definite answer was expected. Patients improving with simple rest and also those immediately requiring the well established therapeutic measures were eliminated; for example, patients with severe pancarditis. In all instances therefore several days' observation was needed to make a rough estimate of the probable course of the case under investigation. Patients observed previously were especially useful, for when two or more former attacks had followed a definite pattern it seemed probable that the present illness would resemble the former ones. This occurred in some of the cases included in the present series.

The daily charting of all possible clinical manifestations, together with the therapeutic agents, is helpful, because the effect of the drug under investigation can readily be compared with that of other therapeutic measures; this is especially useful in the case of rheumatic fever, for which there are several drugs with definite and apparently beneficial effects on some of the most distressing manifestations of the disease. The precautions and measures outlined were closely adhered to during these investigations. An abstract of the course of events is given in the following report of cases, together with as much of the data as it was practical to chart.

REPORT OF CASES

CASE 1.—*History.*—P. H., a woman, aged 21, admitted Dec. 18, 1936, on the ninth day of an indeterminate number of recurrences of a chronic type of rheumatic fever, when 7 years of age had the first definite symptoms of heart disease and when 10 the first definite polyarthritis. She had been treated six years and two years previously in this hospital for a chronic type of rheumatic polyarthritis and carditis. Mitral and aortic valves were both involved. The arthritis had usually been characterized by pain and tenderness, with a minimum of swelling and redness.

Course.—Slowly increasing pain and tenderness had been present in many joints for eight days, with precordial pain for the past two days. On admission there were precordial pain and tenderness, mitral systolic, aortic systolic and diastolic murmurs, and pain and tenderness in the right shoulder, hips, knees and feet. The blood pressure was 124 systolic, 40 diastolic. During the following eight days there was an even, low grade fever, but a rising pulse rate, continuous precordial pain and tenderness, additional painful and tender joints and a rising erythrocyte sedimentation rate all indicated a progressive rheumatic infection.

On the seventeenth day the administration of sulfanilamide was started, 2 Gm. being given for two days and then 3 Gm., a dosage of 70 mg. per kilogram of body weight, for four days. The only beneficial effect noted was some temporary diminution in precordial pain and tenderness. On the other hand, a slight rise in temperature and a marked rise in the pulse rate took place, and additional joints became painful and tender. On the seventh day of this therapy, nausea appeared, cyanosis became distinct, precordial pain was more marked and a further increase in the erythrocyte sedimentation rate was noted. Examination of the blood showed no sulfhemoglobin but some methemoglobin. The administration of sulfanilamide was stopped and aminopyrine was given, with disappearance of the toxic symptoms and slow diminution in the signs of rheumatic activity.

That the rheumatic infection was not stopped was shown by continuation of the abnormal erythrocyte sedimentation rate, tachycardia and low grade fever.

No hemolytic streptococci were found in cultures of material from the nose and throat, and the antistreptolysin titer, which was 150 units at the time of admission, never rose any higher. In this patient, therefore, there was no direct evidence of recent hemolytic streptococcus infection.

Summary.—Seven days' treatment with fair sized doses of sulfanilamide apparently did not favorably affect the rheumatic process in a patient with a low grade, subacute type of infection. On the other hand, general toxic symptoms, methemoglobinemia and a marked rise in the pulse rate gave definite indications that the drug had an unfavorable action, and these signs disappeared when its administration was stopped and aminopyrine was given.

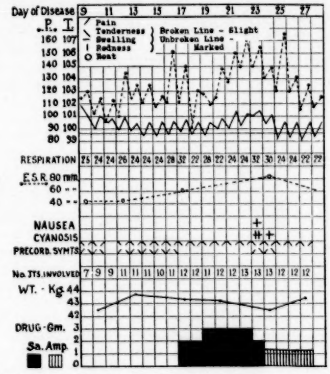

Chart 1.—Course in case 1. In the charts *Sa.* indicates sulfanilamide, *Amp.* aminopyrine and *Asp.* acetylsalicylic acid. Symbols used are explained at the top of this chart.

CASE 2.—*History.*—H. K., a man, aged 24, was admitted Feb. 15, 1937, on the twenty-fifth day of the fifth definite attack of rheumatic fever. All of the attacks had been characterized by chronicity, marked and persistent erythema marginatum and subcutaneous nodules. In the first attack, at the age of 7, there were, in addition, chorea, carditis and pleurisy. In subsequent relapses the fever had been rather low grade and the arthritis mild but persistent. There had been a progressive increase of cardiac involvement, so that the aortic valve was very incompetent; there was also a loud mitral systolic murmur.

Course.—Beginning on January 22, there was a three day attack of "grip." A period of latency of thirteen days followed, and then pain appeared in the calf muscles, followed two days later by mild arthritis in the knees and ankles, which spread to the elbows and shoulders and was accompanied by a fever as high as 103 F. On admission the cardiac murmurs were the same as had been noted previously; the blood pressure was 130 systolic, 50 diastolic. The arthritis was limited to the left arm, and there was beginning erythema marginatum. During the next ten days the fever ranged mostly between 100 and 102.5 F., but the pulse rate was relatively slow. The erythema marginatum became intense, but the arthritic lesions were relatively mild. The erythrocyte sedimentation rate continued at about 112 mm. per hour, and low grade leukocytosis persisted.

As the course resembled so closely the pattern previously observed, the case seemed ideal for a trial of sulfanilamide; so, on the thirty-fifth day, the administration of this drug was started, and it was continued for six days in doses of 4 Gm. (62 mg. per kilogram of body weight). There was a definite though moderate increase in both fever and pulse rate, together with a "dopey feeling," but, with the exception of a fall in weight, the toxic symptoms shown by the other patients were lacking. The rheumatic manifestations continued, with an increase in the number of joints involved and many new cutaneous lesions. When administration of the drug was stopped, there was a fall in temperature and the patient felt better. After a drug-free interval of five days, aminopyrine

was given, with a prompt fall in the temperature and pulse rate and marked amelioration of most of the symptoms. On the fiftieth day, however, a crop of subcutaneous nodules appeared, and new ones were observed for the following two weeks. Thus the picture previously observed was completed, and the patient was not discharged until 140 days after the onset of his illness.

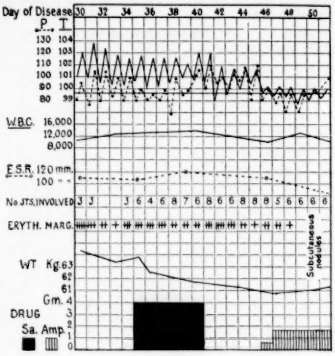

Chart 2.—Course in case 2.

Although no hemolytic streptococci were recovered from this patient, the antistreptolysin titer in the serum rose from 300 units at the time of admission to 500 units ten days later and 600 units by the fiftieth day, when the subcutaneous nodules appeared. The concentration of these antibodies remained at this high level for about two months, then fell slowly. It thus seems probable that hemolytic streptococci had recently been active but that sulfanilamide had no effect on the continued production of antistreptolysin.

Summary.—In a patient who had shown a remarkable constant type of rheumatic fever during four previous attacks, with erythema marginatum and subcutaneous nodules as prominent features, sulfanilamide, in what would be considered adequate dosage, had no beneficial effect on the usual course of events. On the other hand, it seemed to have a pyrogenic and pulse-accelerating influence, in spite of the absence of most of the other usual signs of sulfanilamide intoxication.

CASE 3.—*History.*—C. C., a girl, aged 10, was admitted Dec. 3, 1936, on the twenty-third day of her second attack of rheumatic fever. At the age of 3 she had acute arthritis, involving both legs, for two weeks; no mention was made of cardiac disease at that time.

Course.—November 11 the patient had sore throat and headache lasting one day. She was well for six days, and on the eighth day arthritis of the knees appeared, followed by migratory polyarthritis in both legs and arms. Two days before admission, the twenty-first day of the disease, she received her first medical attention; she then had fever and polyarthritis, which were relieved by some medicine. On admission the temperature was 101 F. and the pulse rate 120. A mitral systolic murmur was present, and the arthritis was limited to the joints of the right arm and hand. During the next two days the temperature and the pulse rate were high and numerous new joints were involved; hence she was given sulfanilamide, first in doses of 1.2 Gm. daily for two days; i. e., 50 mg. per kilogram of body weight. The fever and pulse rate became higher, and precordial pain and tenderness and a pericardial rub appeared. The dose was increased to 2 Gm. (80 mg. per kilogram of body weight), and, while the arthritis diminished in some joints, others were involved. Precordial pain and tenderness were more marked, and the pericardial rub was heard over a larger area. The pulse rate rose to 150 and the respiratory rate to 40. There were almost complete anorexia, with nausea and vomiting, and an increase in leukocytosis.

By the twenty-eighth day (the fourth day of sulfanilamide medication) the condition was such that aminopyrine seemed urgently indicated. One gram of this drug induced a marked fall in temperature and relief of the polyarthritis, but the anorexia, nausea and vomiting continued through the following day. The precordial and abdominal pains were slower in responding, and the rapid pulse and respiratory rates continued, probably because of the pericarditis, for roentgenograms revealed distinct cardiac dilatation.

Twelve days after the beginning of sulfanilamide therapy, a crop of subacute rheumatic nodules appeared, and new ones were noted for the next week; macroscopic nodules persisted for a month.

On the eighty-fourth day, moderate fever, polyarthritis, cardiac dilatation and pleurisy reappeared, but they were relieved promptly by increasing the dose of aminopyrine from 1.2 to 1.8 Gm. Tonsillectomy was performed on the one hundred and sixteenth day. The patient was discharged on the hundred and forty-second day. The heart was distinctly larger than on admission, no new murmurs were present but a musical mitral systolic murmur continued, and there were probably some pericardial adhesions.

No hemolytic streptococci were recovered from cultures of material from the throat made shortly after admission or from the tonsils removed on the one hundred and sixteenth day. The antistreptolysin titer in the serum obtained on the twenty-third day was 700 units, where it remained during the next two months; it then slowly decreased but was still 300 units six

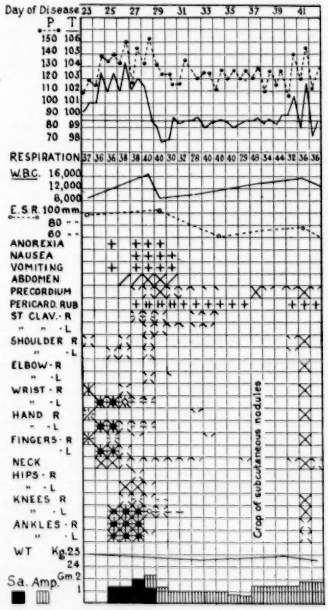

Chart 3.—Course in case 3.

months after the onset of the disease. This is presumptive evidence of recent hemolytic streptococcus infection.

Summary.—Although receiving sulfanilamide in relatively large doses and to the limit of tolerance, the patient continued to show increasing acute signs of arthritis and pancarditis. Furthermore, the subsequent appearance of subcutaneous rheumatic nodules proved that in this patient the drug did not inhibit the development of the proliferative manifestations of the rheumatic infection.

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CASE 4.—*History.*—S. J., a boy, aged 13, admitted May 20, 1937, on the eleventh day of the fourth attack of rheumatic fever, had his first attack of the disease at the age of 9 and two or three relapses subsequently.

Course.—May 10 the patient had a cold in the head and marked coryza. On the eighth day there were fever and arthritis, which began in the right knee and left ankle. Two days later, while still at home, the patient received 0.66 Gm. of sulfanilamide, and he received 0.33 Gm. the day of admission. On admission, May 20, the temperature was 104 F., the pulse rate 120, and the respiratory rate 38; there were arthritis of the right knee, gallop rhythm and mitral systolic and aortic diastolic murmurs. Two days later the arthritis had regressed from the right knee but had migrated to the left knee and the toes of the left foot. The fever continued. As the two day control period indicated a spreading rheumatic process, the administration of sulfanilamide was started in doses of 4 Gm. a day, the equivalent of 54 mg. per kilogram of body weight.

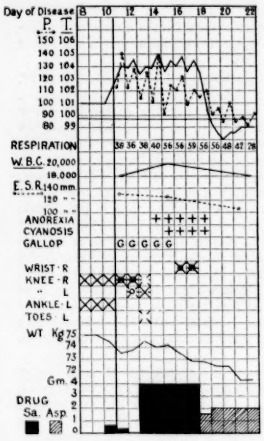

Chart 4.—Course in case 4.

The general course is indicated on chart 4. While the arthritis, present at the beginning of medication, disappeared, the fever and rapid pulse rate continued; the respirations became very rapid, cyanosis increased and anorexia became marked. Arthritis of the right wrist appeared and increased. In fact, the general aspect of the patient indicated need for definite antirheumatic medication, so aminopyrine was given, with the usual spectacular improvement, which continued uninterrupted. The loss in weight could be attributed both to an antiobesity diet and to almost complete anorexia.

That the patient was satisfactorily absorbing sulfanilamide was proved by the results of blood analysis on the third day of this therapy, when the total concentration of sulfanilamide was 7.4 mg. per hundred cubic centimeters and the concentration of the nonconjugated form 5.7 mg.[12] Two days later the total was 8.25 mg., of which 6.9 mg. was nonconjugated, and thirty-six hours after administration of the drug was stopped the total concentration was 1.67 mg., of which 0.9 mg. was nonconjugated. Thus the conjugated sulfanilamide on the three dates was 23, 16 and 46 per cent, respectively.

The antistreptolysin concentration in the blood serum, which was 1,600 units on admission, dropped to 1,000 and then went to 1,200 units, where it remained for over two months.

Summary.—In the fourth definite attack of rheumatic polyarthritis, a boy of 13, with probable involvement of the mitral valve and definite involvement of the aortic valve, received 4 Gm. of sulfanilamide daily for five days, a total of 20 Gm., which produced a concentration of at least 8 mg. per hundred cubic centimeters in the blood. While arthritis, present at the beginning, disappeared, new joints became involved, and a continued high fever and pulse rate, a mounting respiratory rate, cyanosis, nausea and increasing toxicity, with continuing marked leukocytosis, all pointed to little beneficial effect compared with what would have been expected early in an acute streptococcic infection. The contrast with the rapid antisymptomatic influence of aminopyrine was most striking.

CASE 5.—*History.*—F. P., a man, aged 20, was admitted May 24, 1937, on the fifth day of an acute attack of rheumatic fever. This was at least the sixth recurrence of the disease in a patient in whom, at the age of 11, the first manifestation was chorea. He had been treated in this hospital at various times for chorea, polyarthritis and carditis, and during this period both mitral and aortic valvular disease had developed.

Course.—No symptoms of preliminary infection of the upper respiratory tract were present. Four days prior to admission the patient had severe epistaxis, weakness, fever, migratory polyarthritis and persistent precordial pain. These symptoms were much relieved by self medication with 2 Gm. daily doses of aminopyrine, taken for the past two days. On admission the temperature was 101 F. and the pulse rate 100. The only complaint was pain and tenderness of the right knee. Apical systolic and aortic diastolic murmurs were present. The blood pressure was 135 systolic, 50 diastolic. During the next four days the temperature rose to 103 F. but the pulse remained relatively slow. On the eighth day anorexia and vomiting were present on two occasions. On the ninth day, because of recurring polyarthritis, the administration of sulfanilamide was started; 4 Gm. daily, i. e., 50 mg. per kilogram of body weight, was given. Cyanosis appeared and the anorexia continued. On the tenth day, with the same dose, the fever was higher, the pulse rate more rapid and the cyanosis more marked, and there were complete anorexia and more arthritis. On the following day the patient appeared much sicker, and, although fewer joints were involved, the right wrist was more markedly inflamed and the fingers of the left hand were painful and tender. Dyspnea and cyanosis were marked. The appearance of gallop rhythm indicated more marked cardiac involvement. After the third day of sulfanilamide the patient's condition became such that the administration of this drug was stopped and aminopyrine was given. Within a few hours there was symptomatic relief, and the following day the picture was entirely changed, although some cyanosis and dyspnea continued for two days.

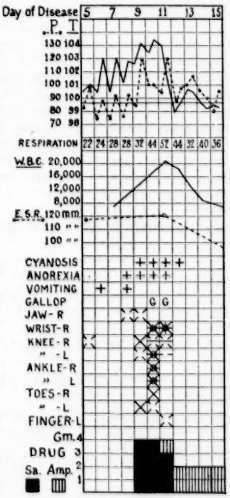

Chart 5.—Course in case 5.

That the rheumatic infection was not stopped by this therapy was shown by the development of pleurisy, together with clinical and electrocardiographic signs of active myocarditis; also, the erythrocyte sedimentation rate was rising and the weight falling during the succeeding month.

While the maximal dose of sulfanilamide was only 50 mg. per kilogram of body weight daily, the concentration in the blood on the third day of medication was 7.5 mg. per hundred cubic centimeters, with 5.9 mg. nonconjugated. Two days after administration of the drug was discontinued there was still a total of 1.5 mg., with 1 mg. nonconjugated. The blood taken at the time of the most marked cyanosis showed no sulfhemoglobin.[13] No hemolytic streptococci were recovered from cultures of material from the nose and throat. The antistreptolysin titer in the blood serum was slightly more than 150 units at the time of admission and rose ten days later to 250 units, where it remained two weeks, then fell slowly. This is presumptive evidence of recent hemolytic streptococcus infection.

12. Sulfanilamide estimations were made according to the method of E. K. Marshall Jr. (Determination of Sulfanilamide in Blood and Urine, Proc. Soc. Exper. Biol. & Med. **36**: 422 [April] 1937).

13. Dr. G. I. Lavin performed these tests.

Summary.—No antirheumatic influence was exerted by sulfanilamide when given in moderate doses to a patient during the second week of a severe relapse. Even this moderate dosage induced toxic symptoms so severe that discontinuance of the medication was indicated on the third day. The contrast with the effect of aminopyrine, exhibited on two occasions, was most striking. The severe cyanosis was not due to sulfhemoglobinemia.

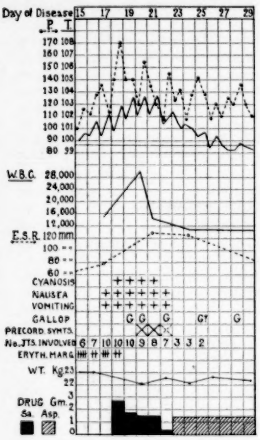

Chart 6.—Course in case 6.

CASE 6.—*History.*—G. M., a girl, aged 7, admitted May 15, 1937, on the fifteenth day of the first attack of rheumatic fever, had a history of numerous infections of the upper respiratory tract, the last one of which began fifteen days previous to admission. The patient had precordial pain on the third, fourth and fifth days and pain and tenderness of the elbow and knees from the fifth day until admission. She was given three tablets a day of acetylsalicylic acid from the eighth to the thirteenth day with slight improvement of the arthritis. A culture of material from the throat on the twelfth day showed 10 per cent matt colonies of hemolytic streptococci. Erythema marginatum appeared on the fourteenth day.

Course.—The patient when admitted had a temperature of 100 F., a pulse rate of 100, extensive erythema marginatum, and pain and tenderness, but no swelling or redness of the shoulders, elbows and knees. A blowing apical systolic murmur was present. About 5 per cent of the colonies in a culture of material from the throat were hemolytic streptococci. During the next three days there were mounting fever and pulse rate, spreading arthritis, diminishing erythema and a rising erythrocyte sedimentation rate. Although hemolytic streptococci persisted in cultures of material from the throat, the colonies were fewer.

Because of increasing symptoms, sulfanilamide therapy was instituted on the eighteenth day; 2.6 Gm. was given, i. e., 113 mg. per kilogram of body weight, in order to obtain rapid saturation. Cyanosis appeared by evening; previously existing nausea and vomiting continued. The next day the dose was dropped to 1.6 Gm. and the two following days to 1.3 Gm. each day. The fever increased, and the pulse rate became very rapid; polyarthritis, consisting of pain and tenderness, continued, and precordial pain and tenderness appeared. Cyanosis, nausea and vomiting became more marked, leukocytosis continued and the erythrocyte sedimentation rate rose from 80 to 130 mm. per hour.

Because of the absence of beneficial effect, all medication was stopped on the twenty-second day, and acetylsalicylic acid therapy was started the twenty-third day, with steady improvement. The systolic murmur assumed a musical character, which persisted until about the forty-eighth day, when it diminished in intensity, but a loud aortic diastolic murmur appeared and has persisted.

Hemolytic streptococci were not found in cultures of material from the throat after the second day of sulfanilamide treatment. The total concentration of sulfanilamide in the blood serum on the evening of the second day of drug therapy was 6 mg. per hundred cubic centimeters, with 5.15 mg. nonconjugated. Two days after the administration of this drug was discontinued there was still a total of 1 mg. of sulfanilamide per hundred cubic centimeters, with 0.83 mg. nonconjugated.

Summary.—There was little diminution in the arthritis, but an increase in the cardiac symptoms, leukocytosis and erythrocyte sedimentation rate, together with increasing toxicity, in a child with a first attack of rheumatic fever who was given all the sulfanilamide she could retain by mouth and who evidently absorbed most of it into the blood stream. The only beneficial effect noted was disappearance of erythema marginatum. That the cardiac involvement was not arrested was shown by the appearance of definite aortic regurgitation one month later. The effect on the streptococcic flora in the throat was indeterminate, because the number of colonies was diminishing before sulfanilamide was given.

CASE 7.—*History.*—C. K., a boy, aged 15, admitted May 10, 1937, on the ninth day of a definite recurrence of rheumatism, had had many attacks of sore throat earlier in life but fewer in the past four years. At the age of 7 a tonsillectomy was performed, and three months later the first joint pains were noted. He spent six months in another hospital, where he was told he had heart disease. He was at home eight months, out of bed a few weeks and then in the hospital five and a half months. He was well for nine months, then in bed almost continuously for nine months. In the spring of 1936 he was again treated for arthritis, in another hospital for three months and at home for two months. Each attack of acute arthritis was relieved with aminopyrine. He stated that in the past seven years "there was never a week without joint pains" but that in the past eight months he had been much better, especially during the last four months. He had been told repeatedly that he had heart disease, but he had had no symptoms of congestive failure.

Course.—May 2 the patient had a sore throat, with slight fever; he then had no symptoms until May 7, when fever appeared, the cervical lymph nodes were tender and swollen and there was definite arthritis of the knees, with pains in the upper extremities. Self medication with 2 Gm. of aminopyrine on the seventh and eighth days gave almost complete relief from arthritic pain, but the swelling in the left knee continued.

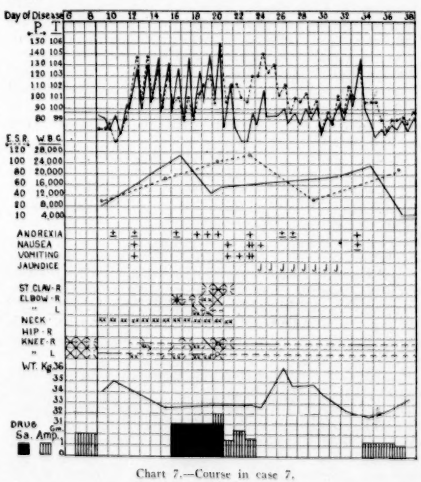

Chart 7.—Course in case 7.

On admission the temperature and the pulse were normal; the patient did not look acutely ill, although he had a sallow color. The heart was normal in size, with only a slight apical systolic murmur. The spleen was moderately enlarged. The neck was stiff, and a roentgenogram showed fusion of the laminae of the third, fourth and fifth cervical vertebrae. The fingers were slightly spindle shaped, with overextension of the first interphalangeal joint and flexion of the distal inter-

phalangeal joints. Marked effusion was present in the left knee. As the influence of the aminopyrine wore off, there appeared a septic fever, rapid pulse rate and recurring arthritis of the knees, characterized by marked effusion but relatively little pain and tenderness. An increase in the leukocytosis and the erythrocyte sedimentation rate and migratory polyarthritis gave evidence by the sixteenth day of progressive rheumatic infection. Whether the condition was true rheumatic fever or an acute phase of chronic rheumatoid arthritis was not definite, but some features favored the latter.

On the sixteenth day the administration of sulfanilamide was started, 3 Gm. daily, or 94 mg. per kilogram of body weight, being given. This dose was given for five days with no beneficial effects; on the contrary, the clinical picture showed a rising pulse rate, a still higher erythrocyte sedimentation rate, persisting leukocytosis and involvement of new joints without any disappearance of the inflammation in those previously involved. Because of the discomfort and the history of beneficial effects of aminopyrine, 1 Gm. of this drug was given on the twentieth day, with the usual favorable influence

Sulfanilamide Content of the Blood in Case 7

Day of Disease	Day of Sulfanilamide	Total, Mg. per 100 Cc.	Nonconjugated, Mg. per 100 Cc.	Conjugated, Mg. per 100 Cc.	Conjugated, Percentage
18th	3d	8.3*	6.5	1.8	22
21th	5th (stopped)	8.2	5.5	2.7	32
23d	.....	3.8*	1.1	2.7	71
24th	.....	3.3	1.1	2.2	66
26th	.....	1.0	0.3	0.7	70
27th	.....	0.3	0.2	0.1	33

* Serum analyzed.

on the arthritis and the temperature. This drug was given three days more, but during this period toxic symptoms, noted at the end of the sulfanilamide therapy, increased, so that finally the patient was constantly nauseated and unable to retain any food or fluids given by mouth. There was also complete suppression of urine for forty-eight hours. Fluids were supplied by hypodermoclysis, intravenous infusion of dextrose and proctoclysis, and this treatment was accompanied by diminution in nausea and vomiting, with renewed ability to take nourishment by mouth. On the twenty-fourth day of the disease a generalized morbiliform rash appeared for only a few hours; icterus was noted, which became more marked, then slowly diminished and finally disappeared after being present a week.

On the twenty-fourth day the patient appeared very anemic, and a blood count showed 2,400,000 erythrocytes and 51 per cent hemoglobin. The icteric index was 25, with the serum bilirubin 2.5 per cent. An extremely high content of blood pigment and the presence of urobilin in the urine suggested some hepatic damage. Then edema appeared in the face and legs, and there was a rapid increase of over 3 Kg., about 10 per cent, in body weight. As the jaundice disappeared the fever recurred, with an increase of effusion in the right knee; hence aminopyrine was again given, with the customary clinical improvement. This time, however, the exhibition of this drug was followed by a drop in leukocytes to 4,600, with only 30 per cent of granulocytes, so it was discontinued, with a fairly rapid return of the leukocytes toward normal. Clinical improvement continued. The anemia diminished, and the only untoward sign that appeared was hematuria, first macroscopic and then microscopic. The urea clearance on the forty-eighth day was normal, and urine concentration tests showed normal ability to concentrate. The results of several analyses of whole blood or serum for the content of sulfanilamide are shown in the accompanying table.

While the patient was taking the drug in as large doses as he could tolerate, the concentration in the blood was over 8 mg. per hundred cubic centimeters. More interesting still was the retention of unusually large amounts for several days after it was no longer given, and during this period the conjugated form was about 70 per cent. The anuria and the subsequent low renal capacity doubtless caused the slow excretion.

Although no hemolytic streptococci were recovered from this patient, the antistreptolysin titer indicated that these microorganisms were probably active. On admission the titer in the serum was only 50 units; six days later, just before the administration of sulfanilamide was started, it was 700 units; two weeks later it had risen to 3,000 units, and it remained at 2,400 units for over two months. Obviously, in this patient the drug did not inhibit the formation of large amounts of this antibody.

Summary.—Although the type of rheumatism could not be definitely determined, it was acute and followed a definite severe angina. The high antistreptolysin curve indicated a recent hemolytic streptococcus infection. Five days of intensive sulfanilamide therapy was accompanied by an increase in the arthritis and induced severe intoxication, with renal and hepatic damage, and anemia, with acute hemolytic jaundice, from which the patient recovered. The contrast between the lack of therapeutic effect and the marked drug intoxication was especially noteworthy.

CASE 8.—*History.*—J. R., a boy, aged 13, admitted March 16, 1937, a week after the onset of his present illness, was said to have had rheumatism annually since 1931. On admission there were signs of consolidation in the left lower lobe, slight cardiac enlargement, mitral systolic and aortic diastolic murmurs, pains in the knees and shoulders, erythema marginatum, albuminuria and hematuria. A few colonies of group A hemolytic streptococci were recovered from cultures of material from the throat.

Course.—During the succeeding two months there were alternating periods of activity and a tendency toward improvement. May 29 a tonsillectomy and adenoidectomy were performed. Group B hemolytic streptococci were isolated from the tonsils. After the operation there was a flare-up in the rheumatic activity. During August a granulomatous area in the nasopharynx was found, and from it group A hemolytic streptococci were repeatedly cultured. There was also evidence of ethmoiditis. With the patient taking daily doses of 1.8 Gm. of acetylsalicylic acid the temperature ranged between 98 and 100 F. and the pulse rate between 80 and 110. September 24, the two hundredth day of the present attack, 2 Gm. of sulfanilamide was given and the following day 3.3 Gm. An elevation of temperature to 102.6 F. followed, with a pulse rate of 148, marked nausea and anorexia and a remarkable increase in the erythema marginatum. Because these symptoms of toxicity persisted on the third day of medication, only 0.6 Gm. was given. Toxic symptoms persisted for twenty-four hours, then disappeared. This episode was followed by disappearance of the hemolytic streptococci from the nasal cultures, disappearance of the erythema marginatum and some improvement for about three weeks. Then another cycle of rheumatic activity appeared.

Summary.—Six grams of sulfanilamide given during three days to a boy with chronic rheumatic fever induced fever, tachycardia, nausea and anorexia, marked general depression and a remarkable increase in erythema marginatum. That these effects were due to the action of the drug was proved by their disappearance when it was withdrawn.

COMMENT

Although only a few cases were studied, if each is considered as a single valid test there are enough to establish the fact that, under the conditions of these observations, sulfanilamide has little, if any, detectable beneficial effect on the course of rheumatic fever, once the condition is well established. Practically all its common manifestations except chorea were represented in this group, and none responded favorably. On the other hand, the toxic effects of the drug were especially marked in these patients, and as a result certain rheumatic manifestations seemed to be intensified.

The criticism might be advanced that the ineffectiveness of sulfanilamide here recorded was due either to insufficient daily dosage or to relatively short periods of administration. In answer it must be noted that all patients except patient 2 received the drug until gastric symptoms made it unpractical to administer more. In five there was marked and in two others moderate

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cyanosis, and in most there was a distinct increase in respiratory rate, which might be attributed either directly to the drug or to an intensification of the disease.

Other toxic symptoms apparently directly attributable to the drug were increasing fever and pulse rate. Thrice these decreased shortly after administration of the drug was stopped, and a fever of 102.6 F. in case 8 the day following the first doses of sulfanilamide left little doubt that the drug was a definite pyrogenic factor. In other cases urgent symptoms indicated the use of aminopyrine; therefore, the fever-inducing role of sulfanilamide could not be so well determined. It seems highly probable, however, that the drug helped to increase the fever in all instances. Moreover, Long and Bliss [14] observed that fever was the most common toxic symptom induced by sulfanilamide. The time relationship between the beginning of drug treatment and the onset of fever differed from the delayed reaction reported by Hageman and Blake; [15] in our cases the onset was immediate. This feature alone might be sufficient contraindication for using sulfanilamide in the presence of rheumatic fever, for hyperpyrexia is a very serious manifestation of this disease; it is necessary to guard constantly against any factor that might induce an elevation of temperature, because this symptom of itself could determine a fatal outcome.

The accelerated pulse rate might have been due to one or more of several influences: (*a*) a direct toxic action of the drug on the heart, (*b*) acidosis and the condition of the blood that was manifest as cyanosis, (*c*) added fever, though in several instances the acceleration of the pulse was out of proportion to the increased temperature, and (*d*) an actual increase in the rheumatic infection. In any event, a markedly accelerated heart rate is a distinctly undesirable influence in any therapeutic measure applied to rheumatic fever, for with this acceleration there is a proportional increase in the functional trauma to which the cardiac valves and the myocardium are subjected while in an inflamed condition, and, even though the outcome is eventual recovery, the amount of residual scarring is probably increased.

Most drugs have toxic capacities that must be considered in relationship to their therapeutic effects, and if the latter outweigh the former the drugs are considered satisfactory. This seems to be the case with the sulfanilamide treatment of serious acute hemolytic streptococcus infections as well as of infections induced by meningococci [16] and gonococci.[10] It is therefore necessary to investigate carefully the influence of this drug on all the manifestations of rheumatic fever that can be closely observed. The difficulty of accurately estimating its influence on the febrile course has been discussed. Its effect on arthritis appears more easily determinable, even though some of the signs are entirely subjective, as was the case in three of our patients in whom pain and tenderness persisted and possibly became more troublesome. In four other patients, however, there were definite objective signs of migration to formerly symptomless joints, even though some joints improved that were previously involved. In other words, the arthritis behaved much as would have been expected had the patients received no treatment.

Erythema marginatum is one of the characteristic signs of continuing rheumatic intoxication. In one patient (patient 6) it disappeared even though other signs of the disease persisted; in a second (patient 2), in whom erythema marginatum had always been an outstanding feature, many new lesions appeared daily during the six days of sulfanilamide therapy, and in a third (patient 8) it was much aggravated. In patient 2 subcutaneous nodules also developed within a fortnight of the time he was fully under the influence of this drug, and the same phenomenon was observed in patient 3. Sulfanilamide therefore exerted no appreciable therapeutic effect on the immediate acute exudative manifestations or any prophylactic influence on the more remote proliferative features that could be accurately observed.

While the effect on the visceral lesions was more difficult to determine, pericarditis developed in patient 3 while she was taking sulfanilamide, and in several there was evidence of myocardial involvement either while they were taking the drug or shortly thereafter. This evidence, in conjunction with the well known tendency of rheumatic myocarditis to develop simultaneously with subcutaneous nodules, makes it highly probable that the cardiac manifestations were not favorably influenced by sulfanilamide.

The leukocyte curve and the erythrocyte sedimentation rate are considered useful objective criteria of the course of rheumatic infection. There was an increase in leukocytosis in all seven patients in whom this feature was accurately measured; in five the count rose to 20,000 or more, and in the two others to 13,000 and 16,000, respectively. Sulfanilamide, likewise, seemed to exert no favorable influence on the erythrocyte sedimentation rate. In one patient a measurement of 125 mm. per hour remained practically the same; in another the rate increased from 115 to 120 mm., and in the others the rise from previous abnormal levels was 10, 15, 20, 30 and 50 mm., respectively. In only one did a falling curve continue downward. While a fall in so short a period might not have been expected or considered clear evidence of therapeutic failure of the drug, the almost consistent increase in rate pointed definitely to such a failure.

Theoretically, the question might be raised as to whether the lack of beneficial effect of sulfanilamide in these patients indicated that the hemolytic streptococcus had no influence in causing their rheumatic state. On the other hand, it is possible that, once this state is established, the drug will have no antirheumatic action, even though it may eliminate the streptococci. It is therefore essential to present the evidence that hemolytic streptococcus infection was present in these subjects, both before and after treatment. This evidence was the isolation of such cocci and the presence of antihemolysins—so-called antistreptolysins—in the blood serum.

In only two patients were hemolytic streptococci recovered from cultures of material from the nose and throat. In explanation may be advanced the argument that no patient was seen at the time of onset of the upper respiratory infection, which was definitely present in six of the eight, and that hemolytic streptococci, which might have been present at the onset, could easily have disappeared from the throat in the interval.

The antistreptolysin [17] curves for six of the eight patients were indicative of fairly recent infection with

14. Long, P. H., and Bliss, Eleanor A.: Para-Aminobenzenesulfonamide and Its Derivatives, Arch. Surg. **34**: 351 (Feb.) 1937.
15. Hageman, P. O., and Blake, F. G.: A Specific Febrile Reaction to Sulfanilamide, J. A. M. A. **109**: 642 (Aug. 28) 1937.
16. Schwentker, F. F.; Gelman, Sidney, and Long, P. H.: The Treatment of Meningococcic Meningitis with Sulfanilamide, J. A. M. A. **108**: 1407 (April 24) 1937.
17. Todd, E. W.: Antihaemolysin Titres in Haemolytic Streptococcal Infections and Their Significance in Rheumatic Fever, Brit. J. Exper. Path. **13**: 248 (June) 1932.

these micro-organisms. The two other curves, showing titers of only 100 to 150 units, might be considered as equivocal evidence; however, the repeated isolation of hemolytic streptococci from the nasopharynx of one of the patients pointed to a focal infection with these bacteria. Of the six with significant antibody titers, two (5 and 6) had curves quickly rising to 250 units from an earlier level of 150, and in one of these the titer eventually reached 350. Patient 2 in the fourth week had a titer of 350 units, which later doubled in strength. A fifth, patient 3, maintained a level of 700 units from the fourth week to the third month. Patient 4 showed 1,600 units in the second week, from 1,000 to 1,200 units during the next four weeks and a slowly falling curve thereafter. For the final patient (7) the curve rose rapidly from 50 units on the ninth day to 700 on the fifteenth and to about 3,000 on the twenty-ninth and then varied between this level and 2,500 for many weeks. This was the patient who suffered the severe sulfanilamide intoxication.

Sulfanilamide therapy had no uniform effect on the antistreptolysin curve. The relation of the titers with respect to exhibition of the drug was as follows: In three patients the titer remained level at 100, 150 and 700 units, respectively; in one it remained level at 500 units and two weeks later rose to 600; in one it rose from about 175 to 250 units and in another from 150 to 350; in patient 7 it rose from 700 to 2,400 units during treatment with the drug and a week later to almost 3,000 units. In only one patient (4) was there a fall during sulfanilamide therapy; the titer dropped from 1,600 to 1,000 units and subsequently rose to 1,200. As the range in curves is about what might have been expected in an untreated group of patients with rheumatic fever of comparable severity, there is little evidence that the formation of antistreptolysin was influenced in any way by the drug. On the other hand, there was strong presumptive evidence that at least six of the patients were responding normally with formation of antibody to recent infection with hemolytic streptococci.

That significant amounts of this antibody should have developed prior to their receiving sulfanilamide is not surprising, because the stimulus to the formation of antistreptolysin doubtless was active from two to four weeks before the therapy was instituted. However, the prolonged, and in some cases rising, antibody curves following the use of such an antistreptococcic agent is of theoretical interest for the following reasons: It seems probable that the course of the antistreptolysin curve might give some indication of the possible elimination—or lack of elimination—of the streptococci as a result of the sulfanilamide therapy, for Todd [18] has found that the titer in the serum of animals falls rapidly as soon as the injection of the antigen is discontinued, and Coburn [19] recorded that guinea pigs maintain high titers when carrying foci of infection. The lack of a definite fall in the antibody curve within a few weeks of sulfanilamide treatment is therefore presumptive evidence of continued production of streptolysin. This evidence is in line with our observation of several other patients, suffering from simple tonsillitis, in whose serum fairly high antistreptolysin titers developed in spite of their receiving sulfanilamide early in the course of the infection.

18. Todd, E. W.: Personal communication to the authors.
19. (*a*) Coburn, A. F.: Personal communication to the authors; (*b*) Observations on the Mechanism of Rheumatic Fever, Lancet **2**: 1025 (Oct. 31) 1936.

Knowledge of the mechanism whereby streptococci may induce the manifestations of rheumatic fever in many, if not all, instances is distinctly theoretical. The hypothesis guiding our general investigations may be formulated as follows: The primary hemolytic streptococcus infection is followed quickly by a state of antitoxic immunity, in contrast to a relatively delayed type-specific antibacterial immunity,[20] and a state of bacterial hypersensitivity (hyperergy to streptococci) is concomitantly induced. With the development of partial immunity, the persisting streptococci are reduced to a state of relative avirulence for the individual but continue to be active in the tonsils, lymph nodes, sinuses and other tissues, where they set up focal infections, which are ideal sites for the further, continuous stimulation of a hypersensitive state of the entire body. Moreover, the persistence of streptococci in these foci results in the elaboration of poisonous substances, either from the bacterial bodies or from the patient's tissues, or from both, which irritate and damage certain portions of the hypersensitive mesenchymal system. Assuming that this mechanism accounts, in part, for the damage inflicted on the rheumatic patient's tissues, it is possible that the injury could be stopped either by lowering the hypersensitivity of the tissues or by removing completely the streptococci from the foci.

That the hypersensitive state of some of the tissues was not lowered is shown by the persistence of marked cutaneous reactivity to intradermal injection of hemolytic streptococcus extract in several of the patients. Moreover, in studying the action of sulfanilamide in guinea pigs infected with hemolytic streptococci, we [21] found that neither in vivo nor in vitro was it possible to demonstrate any distinct diminution in the hypersensitivity of the tissues of animals taking large doses of the drug.

It seems therefore that the only effect which might be expected from this antistreptococcus agent in a rheumatic patient infected with hemolytic streptococci is a diminution in the amount of poisonous substances that might be flowing out of infected foci because most of the bacteria acting in them had been killed. Colebrook and his co-workers,[22] however, have observed that prontosil-treated patients who have recovered from puerperal fever continue to discharge streptococci in the lochia for long periods. We have grown hemolytic streptococci from material from the throats of some sulfanilamide-treated patients for several weeks after they had recovered from tonsillitis, and Longcope [23] has recovered similar micro-organisms from excised tonsils of patients who had received large amounts of the drug. Several observers have reported the persistence of latent foci of hemolytic streptococci in mice treated with large doses of prontosil or sulfanilamide.[24] With such evidence available, it would be surprising if all streptococci were eliminated from the deep-seated foci in our rheumatic patients, who could tolerate only relatively moderate amounts of sulfanilamide; hence it seems highly probable that bacterial toxic substances continued to be elaborated and thrown off from infected foci.

20. Swift, H. F., and Hodge, B. E.: Type-Specific Anti-M Precipitins in Rheumatic and Non-Rheumatic Patients with Hemolytic Streptococcal Infections, Proc. Soc. Exper. Biol. & Med. **34**: 849 (June) 1936. Coburn.[19b]
21. Swift, H. F., and Moen, J. K.: Unpublished observation.
22. Colebrook, Leonard; Kenny, Méave, and others: Treatment of Human Puerperal Infections, and of Experimental Infections in Mice, with Prontosil, Lancet **1**: 1279 (June 6) 1936.
23. Longcope, W. T.: Personal communication to the authors.
24. Long, P. H., and Bliss, E. A.: Para-Amino-Benzene-Sulfonamide and Its Derivatives, J. A. M. A. **108**: 32 (Jan. 2) 1937. Colebrook and his associates.[22]

For the foregoing reasons it is obvious that the therapeutic results in this series of patients do not shed much new light on the possible relationship of hemolytic streptococcus infections to rheumatic fever. Nevertheless, these investigations clearly demonstrate that sulfanilamide, when given in as large doses as can be tolerated after the onset of rheumatic fever, exercises little, if any, ameliorating influence on the course of the rheumatism. Moreover, because the toxic by-effects seem to be specially marked in patients with this infection, the drug may have a deleterious influence on the course of the disease. The prophylactic action of sulfanilamide in rheumatic subjects infected with hemolytic streptococci is still to be determined.

CONCLUSION

The toxic action of sulfanilamide in active rheumatic fever so far outweighs the beneficial therapeutic effect that its administration to patients with this disease does not seem justified.

RECENT ADVANCES IN ANESTHESIA

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Recent advances in anesthesia have increased the surgeon's range of choice of anesthetic for most operations, but especially for operations in the upper part of the abdomen, such as those performed on the gallbladder and its ducts and on the stomach. When the results from anesthetics given by commonly used inhalation methods are satisfactory, there is no good reason for administering these substances otherwise. However, when there seems to be any respiratory obstruction, dyspnea or heaving abdominal movements, quiet respiration and adequate and easy control of administration of the anesthetic can be brought about by the use of a large bore, soft rubber intratracheal (Magill's) tube.[1] In more than 50 per cent of cases this tube can be inserted through the nostril and into the trachea without the necessity of opening the patient's mouth or, by use of the laryngoscope, the tube can be placed under direct vision. When the tube is in place it can be attached to the gas machine and anesthesia can be carried out smoothly, on an even plane, for an indefinite period. With the anesthetist thus removed from the field of operation, and the maximum of room made available to the surgeon, especially in operations on the face, head and neck, operation is facilitated and bleeding is minimized because of quiet respiration and the fact that the assistant, as well as the surgeon, can approach the field easily. When it is unnecessary to connect the tube to the machine, it is left protruding an inch or so from the nose or lips and the mask is applied to the face after the anesthetist has made certain that the end of the tube is under the mask. In this way one can administer ether by the open drop method, using the tube as an airway. This is valuable in operations on the brain because of the quiet respiration and less increased intracranial pressure than obtains when the tube is not used, especially if the airway is at all obstructed. This method is also a help in many orthopedic operations when the patient is lying on his face and must raise much of the weight of the trunk with each respiration. Then a free airway is essential to adequate pulmonary ventilation. It is easier for the patient to breathe through the tube than without it, because the air passage between the vocal cords is usually greater with the tube in place than it normally is. The advantage of this method in intra-abdominal operations, especially in the upper part of the abdomen, is very striking. Quiet respiration permits the surgeon to approach deep-lying parts of the common bile duct without the edges of the wound in the abdominal wall moving more than the minimal amount. The diaphragm is quieter with the reduced effort of breathing, and the results are so encouraging that the tendency is to use the method as a routine rather than only in cases in which it obviously will be needed, as in operating on certain obese persons and on others who do not always take a general anesthetic well. Use of this tube in resuscitation is equally advantageous, and most anesthetists are now prepared to carry out resuscitation under most circumstances in which asphyxia has become a danger. The American Medical Association is greatly interested in resuscitation. It is to be hoped that surgeons will encourage anesthetists to interest themselves in it, and surgeons would do well to have them use the method from time to time so as to maintain their skill in its use.

Since so many agents and methods are available today, it is often possible for anesthesia to be induced with one agent, and, if the patient does not tolerate it well, to change to another. It is of no advantage to the patient to have to tolerate an agent poorly for too long, but many anesthetists delay longer than is actually desirable before deciding to change to another agent or method. This state of affairs no doubt is brought about by the change from the almost routine use of ether to the use of gases and local anesthetics in many cases, and perhaps is partly attributable to pride in being able to anesthetize all patients with one agent or method. In my experience it is more satisfactory to all concerned not to push an agent or method beyond its ordinary limitations, and certainly over a period of years it will be found safer to temper the use of an anesthetic agent.

When the intratracheal method is not available, either because of lack of tubes or of an experienced person to place them, the use of tribrom-ethanol by rectum is of advantage. It may also be used in order that fireproof conditions can be maintained.

If anesthetic rather than analgesic doses of cyclopropane are to be administered, I have found that one should palpate the pulse at short intervals throughout the procedure, and, if the volume or the rate changes, it probably indicates that the patient is not as tolerant of cyclopropane as the average patient, and he exhibits this intolerance through the cardiocirculatory system. My idea is that the gas should be used only in that concentration which does not markedly affect the pulse. I prefer to add ether rather than to increase the concentration of the gas and further to disturb the character of the pulse. However, if patients are tolerant of this gas, or if an anesthetist is experienced in its use, a patient can be carried to a profound degree of anesthesia, but this procedure is not advisable for the inexperienced anesthetist. The experienced anesthetist often can safely administer cyclopropane by Guedel's apneic technic,[2] and it may be of considerable advantage in operations for diaphragmatic hernia through the abdominal approach and in certain operations in and on the chest when the patient has difficulty in ventilating himself.

From the Section on Anesthesia, the Mayo Clinic.
Read before the Section on Surgery, General and Abdominal, at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

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2. Guedel, A. E., and Knoefel, P. K.: Ventricular Fibrillation in Anesthesia, Am. J. Surg. **34**: 496-499 (Dec.) 1936.

For preliminary medication [3] I think that a barbiturate, morphine and atropine have shown themselves to be worth while, especially if the barbiturate that is given before operation is administered in two doses, half the night before operation and the other half the morning of operation. Most of the apprehensive patients come to the operating room without nervousness or fear. Moderation in the dose of preliminary medication is more satisfactory and safer than when large doses are employed. Tribrom-ethanol by rectum has been recommended in place of other preliminary medication, and when used in basal anesthetic doses only it is useful, especially when the patients are children.

Local, regional and spinal anesthesia have been combined with general anesthesia, often to advantage.[4] Infiltration along the line of incision for abdominal operations, together with gas anesthesia, especially with cyclopropane, has given excellent results and carries with it a minimum of untoward reactions. Field blocks, such as those of the cervical nerves and the brachial plexus, minimize the amount of general anesthetic that may be needed if the block is not entirely satisfactory. Spinal anesthetics administered in moderate doses are particularly useful in operations in the upper part of the abdomen. The danger lies in the degree of paralysis and the height to which it rises; in order to keep this within safe bounds, specific safe doses should be administered. When the patient is debilitated or the concentration of hemoglobin is less than 50 per cent, a spinal anesthetic should not be administered. When spinal anesthesia is not entirely adequate, cyclopropane in analgesic doses has made a most desirable combination; that is, wherever an inflammable gas may be used.

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The safest agent from the standpoint of experience is procaine. The next is metycaine (benzoyl-γ-[2-methylpiperidine]-propanol hydrochloride).[5] Whereas there was a time when it was considered essential to have anesthesia last for a long time, in the last two years spinal anesthesia with agents of shorter action has been used. I shall not discuss the agents of which the effects last longer, for they are not as safe as the shorter acting agents.

Metycaine is a somewhat more potent agent than procaine, and in addition it is a good surface anesthetic. Metycaine in 1 per cent solution produces anesthesia more quickly than does 1 per cent procaine, and the anesthesia is more profound and lasts longer. This is especially noticeable in sacral block anesthesia. For spinal anesthesia, metycaine should be used in a smaller dose than the estimated dose of procaine for the same purpose. In addition to its advantage over procaine as a surface anesthetic, it is interesting that individuals who are sensitive to procaine usually can tolerate metycaine without untoward results.

Peridural [6] injection of from 30 to 50 cc. of a 2 per cent procaine-epinephrine solution can be used as a substitute for spinal anesthesia and should have the advantage that it does not produce lumbar puncture headache subsequently. Its value depends on experience in its use and, the technic of its administration once mastered, it produces good results.

Recently there have become available two drugs,[7] sodium n-methyl-cyclohexenyl methyl malonyl urea (evipal soluble) and sodium ethyl l-methyl butyl thiobarbituric acid (pentothal sodium), which can be administered intravenously. Anesthesia is quickly induced, its effect is transient, and the patient awakes without nausea, vomiting or restlessness in nearly all cases. This method is of importance to the surgeon because of the short duration of the anesthesia and because of the fireproof conditions surrounding its use, especially since diathermy and the cautery are so generally employed. One can have fireproof conditions using nitrous oxide and oxygen by simply administering intermittent injections of one of these two drugs instead of adding ether to the gases. This method is of considerable advantage in inducing anesthesia and then maintaining it with inhalation anesthesia if there are patients who are sensitive to general anesthetics. There are even those who suffer from a type of infection which, together with an inhalation anesthetic, throws the patient into convulsions. This is seen from time to time when young persons are suffering from acute appendicitis. If convulsions develop, it is advisable to have at hand one of the barbiturates, with which the convulsions can be controlled while measures for further treatment are instituted; that is, if the patient can be saved at all. In such cases the use of tribrom-ethanol preoperatively will minimize the number of instances in which convulsions will develop.

Intravenous anesthesia can be used when removal of packs is painful, when a T tube must be removed from the common bile duct, and in many cases in which a specimen is to be taken for biopsy but the piece of tissue to be removed is so small that it may be lost through injections of local anesthetics. The technic of intravenous anesthesia is a very important factor, together with its contraindications. It should not be used in operating on children who are less than 10 years of age, because it is a respiratory depressant. It should not be used if patients have marked dyspnea from pulmonary or cardiac disease or if this symptom develops in the course of operation. If preliminary medication is to be used, the dose of intravenous anesthetic will be reduced. I prefer to give the patient preliminary medication, either a barbiturate, or morphine and atropine, or both. The anesthetic agent should be in 5 per cent solution. Anesthesia should be induced in thirty seconds rather than in ten. Respirations should not be entirely stopped at any time and a cotton or paper "butterfly" [8] should be used to show that the airway is patent and is being used. If the solution is injected extravenously, the spot of injection should be massaged to hasten immediate absorption, and moist, hot compresses should be applied for three or four hours. In this way soreness can be avoided in almost all instances.

At present the choice of anesthetic agents and methods is not only wider than ever before, but there are, in many places, physicians who have trained themselves in the use of all these various agents and methods, so that today there are really professional physician anesthetists in the full sense of the word. The demand for the services of these men is widening rapidly, so that in the near future they probably will be more widely available, and, as they are, the number of anesthetics to choose from will increase also.

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ABSTRACT OF DISCUSSION

DR. HENRY S. RUTH, Philadelphia: In surgery of the upper part of the abdomen, technical difficulties frequently present themselves to the surgeon, and therefore it follows that a qualified anesthesiologist should be of greater comparative value in this situation. Surgical intervention in the upper part of the abdomen, especially when on the bile tract, usually requires complete muscular relaxation, to which, in order to facilitate manipulations, should be added quiet respiration, because of the proximity of the diaphragm. Further difficulties are added by the bony framework of the lower chest wall, and the tendency of the pliable and bulky liver to obscure the field. Many nerves and plexuses are found in this region. These should be protected whenever possible from stimulation arising through severe retraction, necessary packing and raising the gallbladder neck. In some instances, reflex stimulation from this area produces a profound reaction in some patients. It has been suggested that this reaction has been caused by stimulation of the celiac plexus. Other reflexes from the same area produce vocal cord adduction and contraction of the abdominal wall. Abdominal packs and marked muscular retraction curtail movements of the diaphragm, which decrease minute volume respiratory interchange, leading to oxygen want, especially when associated with paralysis of the intercostal muscles produced by a high spinal anesthesia or inhalation anesthesia carried to full third plane, third stage. The use of the catheter will preclude vocal cord adduction, and after insertion, second plane anesthesia frequently is satisfactory, for the response of the abdominal muscles to these reflexes is prohibited at this point. When an inflatable cuff is attached to the tracheal end of the catheter, aspiration of vomitus is prevented, which may have been caused by reflex stimulation at the site of operation, and also distention of the stomach during the institution of the apneic technic or artificial respiration is prevented. The addition of closed carbon dioxide absorption technic to the use of the endotracheal catheter provides many quite acceptable features. The closed carbon dioxide absorption technic may be applied by either the to and fro method or the closed circle system. Dr. Lundy has presented an excellent summary of recent advances in anesthesia, but I should like to insert a supplemental word to the effect that a greater technical ability and a more comprehensive knowledge of allied basic sciences are necessary to carry out safely some of these procedures.

DR. RALPH M. TOVELL, Hartford, Conn.: The longer acting drugs for spinal anesthesia commonly employed are nupercaine and pontocaine. The toxicity of pontocaine is ten times that of procaine, whereas the toxicity of nupercaine is thirty times that of procaine and approaches that of cocaine. The relative toxicity of pontocaine, because the dose is smaller, is practically equal to that of procaine. The relative toxicity of nupercaine in my experience, however, considerably exceeds that of procaine. When an untoward reaction occurs after the use of nupercaine, it is directed toward the cardiac side of the cardiorespiratory center. When the untoward reaction is on the respiratory side, something may be done for it, and usually the treatment is successful. This is not true of nupercaine. When an untoward reaction occurs with it, there is little that can be done to improve cardiac action. The duration of the anesthesia obtained with pontocaine is from one to two hours, whereas that obtained with an average dose of nupercaine may be from three to four hours in certain instances. With the nupercaine the anesthesia outlasts or may outlast the operation considerably, and it may complicate the situation when surgical shock occurs postoperatively. Nupercaine and pontocaine should be given to a limited group of patients. They should be distinctly hand picked, and nupercaine should be reserved for those cases in which the operation is expected to exceed two hours. There is one other problem that is common to all types of spinal anesthesia, and that is the control of blood pressure. The ordinary routine is to give 50 mg. of ephedrine preoperatively. If the blood pressure decreases during the operation, there are several alternative methods of treatment. One is the subcutaneous injection of epinephrine, which produces some increase in blood pressure. It may also be used intravenously. Under these circumstances the gradient of increase in blood pressure is rather steep, and the reaction is transitory. Ephedrine may be given intravenously in 25 mg. doses with satisfaction. There are other closely allied drugs, but they function best as local vasoconstrictors. Benzedrine is a weak vasoconstrictor, which is unique in that it is volatile. It may be given by inhalation just as amyl nitrite is given. Frequently spinal anesthesia is supplemented by general anesthesia. By the addition of a simple piece of apparatus to the gas machine, benzedrine inhalant may be administered without disturbing the concentration of the anesthetic gases. This apparatus directs the flow of gases through a glass jar which contains the ampule of benzedrine. Although many situations can now be controlled successfully, research for satisfactory drugs to control blood pressure during spinal anesthesia must continue. It is essential that these potent drugs should be used only by those who know their actions and reactions thoroughly and who know how to control them.

GASTROSCOPIC STUDIES

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Physicians are all familiar with the obscure and highly unsatisfactory status of gastritis which prevailed before the epoch-making studies of Knud Faber [1] and his associates. Their work served as an impetus to others and furthered efforts to extend our knowledge of this most important entity.

After Faber's work came the equally valuable studies of Konjetzny,[2] Kalima,[3] Puhl [4] and others; these were directed chiefly toward research in regard to the stomach preparations obtained from patients on whom gastrectomy had been performed.

Later came the brillant contributions to the subject from the pens of Schindler,[5] Gutzeit,[6] Henning,[7] Chevallier,[8] Moutier [9] and Swalm and his associates;[10] in these, direct studies of the gastric mucous membrane were made possible by the flexible gastroscope. We believe that ultimately the value and dependability of this instrument will be soundly established.

The diagnosis in the cases here presented was based solely on gastroscopic observations, and it is our belief that gastroscopy is the only method on which a reliable diagnosis can be founded. We are thoroughly con-

From the Digestive Clinic of Johns Hopkins Hospital.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

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vinced that a history of alcoholism, of dietetic indiscretions or of tabagism cannot furnish reliable data on which to base a diagnosis of gastritis, and we are also skeptical as to the diagnostic value of roentgenograms in such cases.

We cannot distinguish between gastritis and the dyspepsias or between separate types of gastritis on the basis of symptoms. We can say only that all the gastritic patients that we have seen had symptoms referred to the stomach, the most common and suggestive one being a sensation of fulness and pressure pain. We believe that this comes from the stretching of inflamed walls.

So far, secretory studies have been of no value in indicating the presence or type of gastritis. We have seen inflammation with achylic, normal and hyperacidic fluids. We have seen atrophy with achylia, achylia without atrophy and atrophy with normal gastric juice.

Instead of a detailed analysis of cases, we are presenting our impressions relating to the problem as a whole. These impressions are derived wholly from our careful gastroscopic studies, and we fully realize that our data and interpretations need further study and more conclusive proof before finality can be given to the statements which follow.

In addition to the definite syndrome acute gastritis, described by Faber, inflammatory gastric changes of a chronic or subacute nature frequently occur.

Gastric mucosa is normal when it is unblemished, smooth, glistening, translucent and orange-red, similar to the normal mucous membrane elsewhere in the body. Most healthy people have this type of gastric mucous membrane, which varies surprisingly little in appearance. Gastroscopically we occasionally observe in the gastric mucosa of healthy fasting subjects small red streaks, which are quite easily recognizable as being due to irritation from passage of the tube. Another abnormality in otherwise normal-appearing stomachs is submucosal hemorrhage, varying from the size of a pea to several centimeters in diameter and protruding from the gastric wall. We see these hemorrhages in probably 7 per cent of the cases, located in areas where it is certain there has been no trauma due to the instrument. There is no injection or reaction around them; they are apparently gradually absorbed; some of them, at least, result in small, round, black, pigmented spots. We do not know how to interpret these hemorrhages, nor do we know the nature of the pigments or what tissue forms them. It is in stomachs in which they appear that hemorrhage along the course of the instrument is observed. We rarely see hemorrhage along the line of insertion without observing it in other areas also. We accordingly believe that these hemorrhages mean increased friability, and we know that they seem to cause severe pain at times, but we are not yet prepared to make any statement as to their significance.

When we examine gastroscopically patients with dyspeptic symptoms or definite gastro-intestinal disease, we begin to find a wide variety of changes in the gastric mucosa, apparently inflammatory in origin. Because of insufficient pathologic control, it has been impossible to establish, from gastroscopic appearances, the criteria by which disease entities may invariably be recognized.

There are several good working classifications of gastritis, the simplest being that of Schindler, with its three divisions of superficial, hypertrophic and atrophic. Moutier and others have adopted much more complex classifications based on these three divisions. We believe Schindler's classification is the most satisfactory at present. It is based on a clinical concept. That the three types remain distinct and that atrophy is apt to be an end result of superficial gastritis we of course have not had the experience to verify. To some extent we have been forced to resort to classification on appearances. We are at the moment uncertain whether we can always distinguish between superficial and deep lesions. We also have difficulty in reconciling some of our observations with the words "superficial" and "hypertrophic." We have been able to observe all previously described types and agree that they seem to remain constant over a long period. However, we are not convinced that these constitute separate disease entities, with all their connotations, such as symptomatology, pathology, prognosis and treatment. We have consequently adopted no classifications as final and have tried to group cases on a basis of the activity of the process.

Most gastritic stomachs show definite activity; that is, the lesions seem active. There are evidences of inflammation, hypertrophy, ulceration, hemorrhage, edema and localized injection. This majority includes the superficial and hypertrophic classes described by Schindler. In a small percentage of cases the lesion seems inactive and atrophied. It then corresponds to the atrophic gastritis of Schindler. Without attempting to form or to criticize any classification, we might question whether the important point is not the severity, location and extent, rather than the actual type.

Cases in which gastritis is active seem to fall into several groups. In the large majority there is evidence of definite inflammation. The color has lost the orange tinge and has become dusky red. Grayish mucus is adherent in patches or hanging from the wall like ropes. The glistening highlights are lost. There may be areas of redness, localized injection or submucosal hemorrhage. In the more severe cases one occasionally sees small superficial erosions, some a centimeter in diameter. The margins of these ulcerations sometimes appear slightly indurated. We term this picture superficial gastritis, although Schindler groups the hemorrhagic and erosive pictures under hypertrophy.

In the definitely inflammatory group we also frequently find individual rugae appearing edematous, with hemorrhage or injection or both. This group provides one of our difficulties in classification. The changes are inflammatory and resemble the ones described under the superficial group, but they are obviously more than mere surface changes. On the other hand, the involvement seems to be more an acute edema than an actual proliferation or hypertrophy. We therefore classify all such cases as inflammatory.

Another group consists of cases in which inflammation, if present, is not a predominant feature. In these the mucosa appears normal or nearly normal in color but is thickened. The highlights are presented, abnormal mucus is not a feature and hemorrhage is infrequent. The rugae appear large. Individual rugae often seem thickened and nodular but do not give the impression of edema. In a few such cases small warty nodules occur either on the crests or in the valleys between the folds. We frequently see small patches of mucosal thickening, particularly between folds, resembling thickened mucosal bridges in healing colitis. The observer receives the impression of hypertrophy, a slower, less active process. Such conditions we call hypertrophic gastritis.

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Two other types are recognized which cannot easily be fitted into the inflammatory or hypertrophic groups. First, infrequent cases in which active inflammation is less evident but the entire stomach wall is involved in multiple small, flat hemorrhages and erosions. The few cases of this type that we have seen have also differed from the others in the rapidity with which the process disappears and then recurs. Second, cases in which there is a well marked granular appearance in the preantral zone, localized particularly on the anterior wall. The area involved is usually deep red; otherwise the stomach is normal.

At this point it is in order to mention the postoperative appearance of the stomach. It is more and more evident that considerable damage is produced by the mere opening of the stomach. Of fifteen cases, we have seen only one in which inflammatory changes were not active and severe. In this exception an anterior gastro-enterostomy had been performed two years before. The man had had repeated massive hemorrhages without ulceration or abnormality being demonstrated by x-ray examination or by operation. So far as we could tell, the stomach was perfectly normal except that a line of old hemorrhage and the spots of pigment previously described stretched across the greater curvature in midstomach. With this exception, all the gastro-enterostomized stomachs were badly inflamed, even two years after operation. The gastritis is generally of the active, inflammatory type, with edema and reddening the predominant characteristics.

We have not observed actual ulceration in these stomachs, nor does hemorrhage seem frequent. The severest reaction is generally located in the vicinity of the enterostomy, the tissues often being so swollen that the opening is invisible. In other stomachs the reaction seems to be more general than local.

Other gastroscopists have often remarked that a properly functioning artificial opening resembles the pylorus and acts in much the same way by rhythmic contraction. We have observed this action in only one stomach, in which the opening was located close to the pylorus on the posterior wall. When one realizes that a simple incision of the gastric wall will produce inflammatory changes in the gastric mucosa which persist for months, it is obvious that some of the symptoms following gastric operation arise from this general and localized reaction.

In the active gastritis group we may mention the association of gastritis with gastric or duodenal ulcer. This subject has been partially worked out by pathologists and surgeons. We have only a few observations to make concerning this type of gastritis. One is that the severity of the ulcer seems to be no index of the degree of gastritis. Although all classes occur, even atrophy, the superficial inflammatory type predominates. We should like to suggest that the two diseases may be considered as distinct. The ulcer seems to clear far more readily than the gastritis. We believe that in some of our histories the two may be separated on symptomatology, the immediate dyspeptic element being due to gastritis. We have rarely been able to find the juxtapyloric gastritis described by Faber and other pathologists, though we have no explanation for this. We do not deny its frequency; we simply state that gastroscopically juxtapyloric gastritis seems rather uncommon.

The second great division is the passive, inactive or atrophic group. In unmixed atrophy no active inflammation is present. The mucosa merely looks thin and unhealthy. Advanced, unquestioned classic atrophy is characteristic. The rugae are usually absent, though not invariably. If present, they thin out under inflation. The color is bluish gray. The mucosa looks thin, and a network of blue veins is the most noticeable feature. Here again considerable variation occurs, and one wonders just what to call disease. One frequently encounters areas in which bluish veins are visible, and we believe that, normally, blood vessels are visible on the anterior wall of the preantral zone and increase in visibility under inflation. Occasionally the mucosa in these areas has a bluish tinge. When this is present the condition is called atrophy. If these areas are noticed only when the stomach is fully dilated, the diagnosis is uncertain, since mere dilatation, as Faber has most reasonably remarked, will thin the mucosa. In other cases the mucosa has a yellow tinge, varying from normal in the absence of rugae, loss of the red element, and the presence of large, widely branching blue vessels. We wonder whether this differs from other atrophy in degree or in the nature of the process.

In many cases there exists, in addition to the groundwork of atrophy, a superimposed activity, generally of the superficial type.

The most marked evidence of atrophy is of course found in pernicious anemia, but little work has yet been done on the localization of these changes, as previously pointed out. It is to be particularly stressed that in atrophy the changes frequently tend to become localized in one of the six zones of the stomach. Here again we emphasize that it may make some difference in which area the change occurs, whether in the region where the intrinsic factor is produced or primarily in the acid-producing areas.

We have under treatment at present one patient with severe pernicious anemia, gradually recovering by means of liver extract. Only the mildest superficial irritation is present in the antral and preantral zones, but severe atrophy, together with some activity, apparently superficial, is sharply localized in the proximal anterior and posterior walls.

Localized atrophy in pernicious anemia brings us to several interesting questions. If atrophy interferes with the function of the involved mucosa, it would seem that gastritis localized in the antrum might result in pernicious anemia with normal acidity, or that atrophy localized in the acid-bearing region, not involving the antrum, might produce achylia without pernicious anemia. It is possible that recovery might take place in either case, and that recovery does occur has been indicated by Jones, Benedict and Hampton,[11] as well as by foreign scientists. Aside from pernicious anemia, however, we run unexpectedly into atrophic gastritis. For instance, in some cases atrophy involved the entire stomach and yet the patient had no blood changes. Symptomatically we can see no difference between these cases and any other cases of gastritis.

One important fact stands out; that is, that these cases do not conform to previous clinical suppositions. They do not seem to follow atony, achylia, flaccidity or body type.

We have every intention of continuing our researches and have set forth in this contribution our studies to date in the hope of stimulating other workers to increased activity in this fascinating field of endeavor.

12 East Eager Street.

11. Jones, C. M.; Benedict, E. B., and Hampton, A. O.: Am. J. M. Sc. **190**: 596 (Nov.) 1935.

ABSTRACT OF DISCUSSION

DR. EDWARD BENSON BENEDICT, Boston: In the past four years at the Massachusetts General Hospital we have examined some 500 stomachs by gastroscopy, using the Wolf-Schindler flexible gastroscope. We have found this instrument of great value in the diagnosis of ulcer and carcinoma, but particularly useful in gastritis. In gastritis I think it is important to have a working classification, though I do not believe that any classification can be hard and fast. Dr. Schindler's classification is the simplest, considering the cases as superficial, atrophic or hypertrophic gastritis.

DR. RUDOLF SCHINDLER, Chicago: It has been contended that, although gastroscopy be the only reliable method, chronic gastritis often can be diagnosed by the anamnesis alone. It is to the great merit of Drs. Gaither and Borland that they have taken up this question by systematic gastroscopic research. My own opinion is based on more than 1,500 cases observed clinically and gastroscopically, many of them over a period of months and years, up to twelve years. I believe, as do Drs. Gaither and Borland, that the diagnosis of that frequent disease is possible only gastroscopically, that anamnesis, physical examination, laboratory methods, and especially x-rays generally are useless for a correct diagnosis. Gross hemorrhages, even with fatal end, have been described in chronic gastritis by all gastroscopists. It is typical that the patient felt fine although the severe alterations of the mucosa were still present. Anacidity in such cases is not frequent. Hyperacidity is found in many instances. An infinite amount of such case reports could be given. Chronic gastritis is a severe disease and all symptoms are variable. I agree with Drs. Gaither and Borland that no definite observations are conclusive except the gastroscopic ones, which, for the expert, are diagnostic.

DR. WILLIAM A. SWALM, Philadelphia: There is one point I should like to bring out and that is that hypertrophic gastritis has been seen in one portion with atrophic manifestations in other parts of the stomach. Mays recently published histologic observations in which there was ulcerative gastritis with a hemorrhagic infarct at the deeper part of the ulcer, and in another portion of the stomach an atrophic gastritis. He noted that hemorrhage was more likely to occur when an infarct was deeply situated. Another important point is that we must bear in mind that, when x-ray examination shows duodenal defects, the problem of spasm due to gastroduodenitis must be kept in mind, as shown in the cases of Faber and Andersen. Gastroscopy has revealed gastritis in cases in which x-ray examination showed duodenal defects without crater, but I have not had operative proof of whether ulcer was present or not.

DR. BURRILL B. CROHN, New York: Hemorrhagic colitis, like hemorrhagic gastritis, lends itself to extensive, severe, often exsanguinous hemorrhages. In a case of right-sided colitis, eight years after a supposed cure, a sudden hemorrhage was so severe that this young woman's hemoglobin dropped from 100 per cent to 28 per cent within four hours. This hemorrhage was again repeated; subtotal colectomy was performed. The mucous membrane was congested and showed no discrete ulcerations but a hyperplastic mucosa without definite points of ulceration but covered with petechial areas from which the blood had transuded. I believe that Dr. Gaither published last year an article on the evaluation of gastroscopic surgery in which he spoke favorably of the end results of gastrostomy. Did I understand him to say that, in fifteen of sixteen cases of gastrostomy, severe gastritis was present postoperatively? If so, how does he harmonize his very satisfactory clinical report of cases of gastrostomy with his gastroscopic picture of gastritis?

DR. JAMES L. BORLAND, Jacksonville, Fla.: Dr. Crohn's remarks concerning the amount of bleeding that may occur from a small lesion are well made. We observe quite large hemorrhages from quite small lesions by gastroscopy. We do not offer these observations as contraindications to surgery, of course. We merely indicate that, whenever the stomach is opened, considerable residual inflammation remains for quite long periods and many of the postoperative symptoms are probably due to this. We suggest that patients who have had gastric surgery must be followed for some time and that more attention must be paid to their diet than has hitherto been the case. I should like to reemphasize the point also that the diagnosis of gastritis still is obscure. I believe that we have encountered a new field of pathology and one that is worth careful consideration. What the outcome will be I think no one can say at present. It may be that we shall conclude that many of the things that we now call gastritis will in the future be totally disregarded. It being a new field, however, we must attempt to evaluate even the smallest variation from normal until such time as continued observation shall have demonstrated the true status.

DR. ERNEST HOWARD GAITHER, Baltimore: In answering Dr. Crohn, the cases that we reported were thoroughly investigated from a clinical standpoint; the clinical histories were taken with great care and were exactly as reported by the patients. We noted those in which the patients were greatly helped and also those claiming to have been cured. Dr. Borland and I have shown in our research that the localized appearance of the mucous membrane certainly cannot be taken as a final criterion as to the severity or mildness of symptoms. Symptomatically, some of the patients presented every evidence of erosions and gastritis, yet after careful gastroscopic examination it was discovered that changes were extremely mild or practically nil. In many patients who presented the most outspoken symptoms, the mucous membrane was practically normal.

Clinical Notes, Suggestions and New Instruments

EFFECT OF SULFANILAMIDE ON THE OXYGEN CAPACITY OF THE BLOOD

J. W. MULL, PH.D., AND J. T. SMITH, M.D., CLEVELAND

In view of the rapidly increasing use of sulfanilamide, observations of its effect in individual cases may be of considerable value. The following history shows that in one case at least there was not only a cyanosis, which is frequently observed, but an actual lowering of the capacity of the blood for oxygen.

A well developed young woman, admitted to the Maternity Hospital June 21, was delivered the same day by breech extraction of an eight and one-half to nine months baby boy weighing 2,640 Gm. The delivery was made under ether anesthesia, with morphine and scopolamine during labor. A first degree laceration was repaired at the time of delivery. The child was normal and showed no unusual symptoms while under our observation. After a few days the mother began to complain of pain in the lower part of the abdomen, which was accompanied by a profuse lochia with a very offensive odor, occasional nervous chills and a temperature varying between 37 and 39.9 C. (98.7 and 104 F.). This pain and lochia persisted in spite of treatment, and on June 26 the patient was placed under isolation precautions. June 27 at 11 p. m., with a temperature of 39.5 C. (103.1 F.), she

Blood Determinations

Date	Oxygen in Volume per Cent: Content	Oxygen in Volume per Cent: Capacity	Per Cent Saturated	Grams Hemoglobin: Oxygen Capacity	Grams Hemoglobin: Alkaline Hematin	White Blood Cells	Red Blood Cells
6/21/37*	12.99	14.74	88.1	10.62	....	.....	.....
6/26/37	.....	.....	....	....	....	5,400	2,760,000
6/28/37	.....	.....	....	.....	....	11,200	.....
6/29/37	5.17	12.97	39.8	9.30	10.7	.....	3,400,000
6/30/37	.....	.....	.....	.....	.....	7,900	.....
7/ 1/37	6.35	10.73	59.1	7.63	8.7	.....	2,510,000
7/ 2/37	480 cc. of whole blood given						
7/ 3/37	5.30	16.55	32.0	11.97	11.8	.....	3,430,000

* Taken at delivery.

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suffered a severe chill lasting twenty minutes. Twelve hours later 15 grains (1 Gm.) of sulfanilamide was given. The following day, the 29th, 15 grains was given at 6 a. m. and 11 a. m., and, on the 30th, 15 grains was given at 6 a. m., 11 a. m., and 5 p. m., and at 11 p. m. a final dose of 5 grains (0.32 Gm.). Cyanosis developed almost at once and on the 29th the oxygen capacity of the blood was determined by the manometric method of Van Slyke and Neill.[1] The results of this determination, together with the subsequent ones and that made at the time of delivery, are given in the accompanying table. From these figures it is apparent that the patient suffered not only a sharp drop in the oxygen content of the blood but also a distinct fall in the capacity of the blood for absorbing oxygen. The blood showed a peculiar color when aerated, never attaining the bright red of normal oxygenated blood. The differences in the hemoglobin by the oxygen capacity method and the alkaline hematin method are also significant of the inability of the blood to take on oxygen normally.

Following the reduction in the dose of sulfanilamide on the 30th, the drug was discontinued. July 2, 480 cc. of whole blood was given by indirect transfusion, following which the patient made an uneventful recovery and was discharged from the hospital July 16. Blood cultures taken June 26 and 28 were reported as showing no growth in eight days. A spectroscopic examination failed to show either methemoglobin or sulfhemoglobin.

These observations indicate the necessity not only for giving oxygen but also for increasing the capacity of the blood for taking up oxygen.

2065 Adelbert Road.

ALLERGIC CONJUNCTIVITIS DUE TO FUNGI

FRANK A. SIMON, M.D., LOUISVILLE, KY.

Fungi can cause disease of man in two ways: 1. They may produce an infection. 2. Contact of fungi with mucous membranes may result in absorption of antigenic material with consequent development of hypersensitiveness without infection; subsequent contact with the same fungi results in an allergic reaction. In the past few years increased attention has been directed toward this hypersensitiveness to fungi without infection, although the condition has been known since the work of Storm van Leeuwen.[1] Many cases are now on record and the routine use of fungus extracts in allergic skin tests is becoming the accepted practice. Such routine tests indicate that, in certain geographical locations at least, an appreciable percentage of allergic patients is sensitive to fungi; the work of Durham[2] indicates that the atmospheric concentration of fungus spores may approximate that of ragweed pollen grains.

In most of the cases reported the patients are sensitive to the air-borne spores of fungi and they have respiratory symptoms, particularly those of allergic rhinitis and asthma. The following case is believed to be of interest because of the fact that the symptoms are limited entirely to the conjunctivae:

A man, aged 38, gave a history of recurrent attacks of redness, itching and burning of the eyes during the past four years. These attacks were of variable duration, lasting from two or three weeks to several months. They were limited almost entirely to the summer and fall seasons, although he had a few mild attacks during the winter and spring. His symptoms were most pronounced in June, July and August.

He lives in a very old, damp, brick house surrounded by trees. His symptoms were worse at home and better on trips away from home. He makes frequent trips to New York on air-conditioned trains and under these circumstances his symptoms are greatly relieved or entirely absent.

He had summer hay fever every year for three or four years but this left entirely and he has been free from such symptoms during the past three years. His past history is otherwise irrelevant. His daughter has hay fever.

Examination of the eyes by Dr. Claude T. Wolf revealed the conjunctival type of inflammation of both eyes without other involvement.

The results of skin tests are as follows:

1. Scratch Method: Slightly positive reactions to timothy, orchard grass, blue grass and oak pollens. Strongly positive reaction to the fungus Alternaria.

2. Intradermal Method: Moderately positive reactions to orris root, horse dander, ragweed pollen and several foods.

In correlating these results with the clinical history I found that the patient's symptoms did not coincide with the pollination season of any of the "plants" which gave skin tests. For example, he usually has conjunctivitis in July when there are no ragweed or oak pollens and practically no grass pollens in the air. His symptoms cannot be ascribed to foods because his diet is not subject to the seasonal variations, as indicated by the history. Nor can they be ascribed to orris root or horse dander because there is no clinical basis for such an assumption. These substances all gave small tests compared with that obtained with Alternaria. The seasonal variation of his symptoms is in perfect agreement with the sporulating season of fungi, as described by Feinberg.[3]

In order to investigate further the influence of fungi on the patient's symptoms, six Petri dishes containing Sabouraud's medium were exposed in different parts of his home. In a few days a good growth of fungi was obtained from which eighteen pure cultures were grown, and an extract of each was made with phenolated (0.4 per cent) physiologic solution of sodium chloride. The extracts of Alternaria and of Cladosporium gave definitely positive skin tests (scratch method). The other extracts gave negative tests. All extracts gave negative skin tests on control subjects. A drop of the Alternaria extract applied to the conjunctiva resulted in an intensely red, itching reaction, which it was necessary to control with solution of epinephrine. A drop of the same extract applied to the conjunctiva of a control subject had no apparent effect.

A series of thirty-one injections of the extracts of Alternaria and Cladosporium was given (plus ragweed and mixed grass pollens) beginning July 24, 1935, and ending March 15, 1937. During the summer of 1936 the patient's condition was greatly improved and in 1937 he had practically no conjunctivitis at all.

SUMMARY AND CONCLUSIONS

In a study of a case of conjunctivitis the following evidence indicates that the chief etiologic factor is an allergic reaction to the spores of air-borne fungi:

1. Seasonal variations in the patient's symptoms coincided with seasonal variations in the atmospheric concentration of fungus spores.

2. Changes in the patient's geographical location (with presumable changes in atmospheric concentration of fungus spores) were accompanied by changes in his symptoms.

3. Skin tests with fungus extracts were definitely positive.

4. The clinical symptoms of conjunctivitis were reproduced by the application of fungus extract to the conjunctiva (the control conjunctival test in a nonsensitive subject being negative).

5. The patient was exposed to fungus spores as shown by the fact that fungi were cultured in abundance from the air in his home.

6. Hyposensitization (desensitization) with fungus extracts was followed by relief of symptoms.

332 West Broadway.

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From the Department of Medicine of the University of Louisville School of Medicine and the Bacteriological and Serological Laboratories of the Louisville City Health Department.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

THE PARAFFIN BATH ACCEPTABLE

Manufacturer: Thermo-Electric Company, 717 Frankfort Avenue, Cleveland.

The Paraffin Bath is recommended for controlling the heat of paraffin used in therapeutic treatments in the hospital or home. An Arm and Foot Bath, Model B Senior, was submitted to the Council for consideration. This particular model is 28 by 12 by 13 inches (deep) and weighs 85 pounds when crated for shipping. In the firm's opinion it is thoroughly insulated. It operates on either alternating or direct current. The heat regulating mechanism includes a time switch, a maintenance element independent of the former and a thermostatic high limit control.

Paraffin is placed in the inside of the bath. The latter is made of stainless steel with joints securely soldered. A coating of an electrical insulating cement covers the outside of the bath proper. The coating is baked on in a slow oven. Encircling the entire bath and covering the bottom is the melting element, which is laid on top of the cement. The maintenance element is placed on the bottom. The casing of chrome steel is then built around the sides and ends of the tub. Between this casing and the cement encased elements, mineral wool is packed firmly for insulation purposes. The bottom is packed similarly. A one piece wooden bottom cover is pressed on and fastened in place, so that the patient's extremity rests on wood rather than steel. The steel stand is finished in white enamel. A wooden cover, also white enamel, fits over the bath to keep the paraffin clean when not in use.

Paraffin Bath.

In operating the unit, one first turns on the time switch, thus connecting the melting element, which will liquefy the paraffin in about two hours. The current thus used is 1,200 watts. The maintenance element will keep the bath at operating temperature, from 120 to 135 F., and will draw about 90 watts of current. The time switch can be turned on for only one hour or fractions of an hour at one setting. Consequently the bath may not be overheated when the operator forgets to turn off the switch. However, if the operator wishes to sterilize the bath it can be heated up to 212 F. by turning on the time switch for an hour or less, after the bath is already heated.

According to the firm, the maintenance element is designed to keep the bath at the proper operating temperature. It will not heat the bath over 150 F. even when the cover is on. The thermostatic high control comes into action only in event of failure of the other controls. It is set for 200 F. unless the physician wishes it set at a higher point.

Different conditions prevailing at the various hospitals using the baths require corresponding variations in attention to the controls. For instance, the maintenance element delivers sufficient heat to keep the bath melted and at operating temperature in a room of about 70 F., with the cover off the bath. If the bath is in constant use, the time switch will have to be turned on for five minutes at a time occasionally in order to keep the paraffin melted. If the bath stands for some time with the cover on, it becomes too hot for the patient to use. However, each operator can readily learn to operate the controls under the particular condition prevailing in his practice.

The only therapeutic claim made for the bath is that it affords a convenient method, pleasant and soothing to the patient, of applying heat to the extremities. The heat is said to be steady and penetrating, yielding a pleasant sensation of warmth and comfort, which persists for several hours after the treatment.

The unit was investigated in a clinic acceptable to the Council and found to give satisfactory service and support the claims made for it by the manufacturers.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Paraffin Bath for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

PAUL NICHOLAS LEECH, Secretary.

PLANT'S MAGNESIA WAFERS OMITTED FROM N. N. R.

Plant's Magnesia Wafers (Plant Products Company, distributor) were accepted in 1930 for use as an alkaline laxative and antacid. The last period of acceptance expired at the close of 1936. Repeated requests have failed to secure the necessary material for reconsideration from the distributor. Reply to one of the Council's letters was received but no reconsideration material was submitted with this letter, although it was stated that the product is still being marketed.

According to information in the Council's files, the marketing of the product is now being done by a firm other than the original distributor. Additional requests for reacceptance material have produced no reply.

Since the firm which originally submitted the product to the Council does not reply to the Council's requests, and since the present distributor of the product has not requested the Council's reconsideration nor has it submitted any material on which to base the reconsideration, the Council is obliged to omit Plant's Magnesia Wafers from New and Nonofficial Remedies.

NUPERCAINAL-"CIBA" NOT ACCEPTABLE FOR N. N. R.

Nupercaine-Ciba (the hydrochloride) has for some time stood accepted by the Council as a local anesthetic. At the request of the distributor, the Council in 1931 took up consideration of the base, which at that time was marketed in the form of Nupercaine Ointment 1%. On account of the danger from the use of powerful anesthetics by the public the Council objected to the unsupervised use of Nupercaine for sunburn and burns. When informed of the Council's objection the firm asked that the consideration be withdrawn and was informed that the procedure of the Council did not permit "withdrawals" of consideration but that it was the Council's duty to inform the medical profession of any objectionable features if the product was still on the market.

Subsequently, the firm changed the name of the product to "Nupercainal-Ciba" and circularized the medical profession widely. When this was brought to the attention of the Council, packages were purchased on the open market, and it was found that the objectionable claims were still maintained and that the trade package contained the names of diseases. The firm was informed of this and further of the Council's objection to the coined proprietary name "Nupercainal." The Council's objection to the name is based on the fact that it tends to confusion and is against the public interest. It does not make clear that the active ingredient is Nupercaine, and further it creates the impression that the preparation is some chemical derivative of Nupercaine instead of being a simple mixture.

Some correspondence ensued in which the firm agreed to abandon the objectionable claims and to revise satisfactorily the trade package, in the end deleting from the label and tube claims which had been found objectionable and submitting a trade package to attest the omission of the trade package circular to which objection had been made. The firm, however, refused to meet the Council's objection to the name. The Council was therefore compelled to declare the product unacceptable for N. N. R. The firm was informed that the advertising for Nupercainal must be kept quite distinct from that issued for Nupercaine, else the acceptance of the latter might be jeopardized.

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SATURDAY, FEBRUARY 5, 1938

DOCTORS, PARENTS AND TEACHERS

Since 1930 the American Medical Association has been officially represented on a committee of the National Congress of Parents and Teachers concerned with the Summer Round-Up of the Children, a project carried out to improve the health of the preschool child. This movement was originated in the early 1920's, about the time when interest in infant health had reached its peak. In the preschool years, from 1 to 5, many physical conditions or bad health habits develop which may be detrimental to the child on entering school. The approach to the problem was determined by the method then in vogue in every public health movement, the establishment of clinics. The assistance of physicians was requested and in a great many localities freely given by them, even when they could not approve of some of the methods and results which were inherent in the clinic procedure.

The weaknesses of the original summer round-up plan were due mainly to the procedure by which examinations were made in assembled group clinics. This led to hasty examination, inadequate time for conferring with parents, sketchy recording and poor follow-up. Sometimes there were disagreements between the examining physician and the family physician, to whom the patient went ultimately for such treatment as was recommended following the examination. In 1934, therefore, the advisory committee for the summer round-up recommended a change in policy looking toward the examination of children in the offices of family physicians, with the payment of physicians for such examinations, when feasible, by the parents. This presented a difficult problem in transition from one method to another. The clinic method has the advantage of mass psychology; it is easier to get examinations made free in crowds than at a price in solitude, though the latter system undoubtedly produces the better examination. To the credit of the national congress and its state congresses and local units, the initial falling off in numbers of children that were examined did not discourage them. They persisted at the task. The figures for the 1936 round-up, just published, justify the new policy and indicate that as time goes on it will become more widely used.

At a meeting of the Advisory Committee to the Summer Round-Up, held in New York January 21, and attended by the representative of the American Medical Association,[1] the following figures, among others referring to the 1936 round-up, were released:[2] More than 7,000 units of the national congress registered for participation in the summer round-up, of which 3,996 carried it through and 3,662 met the required standards. In the communities represented by the registering units, 183,472 children entered kindergarten or first grade for the first time; 98,339 of these were examined, and 21,040 of the examinations were conducted in the office of the family physician. The number of children referred to a physician was 41,610; the number actually taken to a physician and so entered in the record was 16,019. More may have gone but not been reported. Children not previously vaccinated against smallpox who received this important prophylaxis numbered 44,071; diphtheria immunizations totaled 35,527, and typhoid vaccinations 3,521.

The blank for recording the examinations and the subsequent treatment has been donated by the American Medical Association, in part, through *Hygeia*. This blank has been revised from time to time. The latest revision, which has just been approved by the advisory committee, was made by the Bureau of Health and Public Instruction with the advice of numerous physicians who have had experience in the use of the blank. The new blank, greatly simplified as compared with previous editions, will be used in the 1939 round-up. Blanks for 1938 will continue in the older form.

The Summer Round-Up of the Children has been marked, for the most part, by the harmonious cooperation of the parent-teacher associations and the medical profession. Occasional misunderstandings have usually been readily adjusted. This contribution to the public health has been significant not alone in the value of the physical examinations, the medical treatments and the prophylactic inoculations growing out of them but in establishing the principle that the vital factor in medical care, including preventive measures, is the family doctor.

1. Dr. W. W. Bauer.

2. The Summer Round-Up of the Children: General Summary of Results of 1936 Campaign; Summary of Results by State Totals, National Congress of Parents and Teachers, 1201 Sixteenth Street N.W., Washington, D. C.

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INVESTIGATION OF SHELL-FISH POISONING

In San Francisco in July 1927 an adult ate a dozen and a half mussels for supper and died of respiratory paralysis five hours later while asleep.[1] A 12 year old boy ate eight raw mussels and died three and a half hours later. A boy 2 years old drank a small glass of broth with three mussels and died in five and a half hours. Three other deaths occurred at that time, and a total of 102 persons from the central California coast area became ill of mussel poisoning. Since then, including the year 1936, ten more deaths have been known to occur from mussel poisoning in Alaska, in Oregon and along the California coast. In all, 243 persons have been made ill, all suffering unmistakably from mussel poisoning. Sixty-two cases were reported in California in July and August 1929 with four deaths, two cases in 1930, forty cases in June and July 1932 with one death, twenty-two cases in 1933 with one death, twelve cases in 1934 with two deaths, and three cases in 1936 with two deaths. The disturbance centered in the neighborhood of the Golden Gate extending roughly one hundred miles north and south. Outbreaks of shellfish poisoning have also been reported from Scotland, Germany, Norway, France and Japan. Compared with the European outbreaks, the California epidemics involved much larger areas.

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Investigators at the Hooper Foundation, University of California,[2] have been studying this problem to determine the source of the poison in the mussels and to isolate it if possible. The observations recorded in the last nine years have shown that mussel poisoning has occurred only in the summer months between May and October. Conducive to a large epidemic is a coincidence of fair weather and favorable low tides over the week ends, when most of the shellfish are collected and consumed. The poisonous mussels were derived from the open shore of the ocean. Not a case of poisoning occurred from eating mussels gathered in San Francisco Bay or other bays. However, there is some evidence that mussel poison may at times exist within the bay of San Francisco. Quite recently highly poisonous shell-fish have made their appearance in southern California. Specimens of mussels collected from big Sycamore Canyon in southern California have shown high toxicity.

Poisonous mussels cannot be readily distinguished from normal mussels when collected. In the laboratory in aerated filtered sea water they function normally, and if scrubbed thoroughly and the water changed frequently in the first few days their mortality in the laboratory is no higher than that of normal mussels.

Although many theories were proposed to explain the occurrence of poison in shell-fish, as the investigation progressed it became apparent that the poison was contained in the ocean water and approached the shell-fish beds from time to time from off shore. The search for the causative factor was narrowed to some substance in the water and a strong possibility was that it might be the food of the shell-fish. Mussels feed on plankton. Of the plankton forms used as food by mussels, it has been found that an increase in the number of certain species of the genus Gonyaulax occurred preceding and during each poison period. Brilliant displays of phosphorescence in the water have been noted at times preceding the occurrence of the poison in mussels. Large increases in the dinoflagellates have also been accompanied by patches of "red water" as the result of a change in the color of Gonyaulax from golden to reddish brown.

Stohler noted that the stomachs of the poisonous mussels were usually full of undigested food, while the stomachs of normal mussels were more nearly empty. A study of the food in mussels was begun in 1932. An identical poison was found in the sand-crab, which also feeds on plankton. A detailed count of the organisms in plankton during a period of strong toxicity in mussels showed the presence of Gonyaulax catenella in large numbers. This fact immediately aroused suspicion, and numerous qualitative and quantitative studies were made of the plankton forms used as food by the mussels.

The paralytic shell-fish poison was definitely demonstrated in 1933 for the first time in plankton residues. This poison was compared with an extract of poisonous mussels and found to be identical in solubility, insolubility, stability and symptoms produced in experimental animals. Furthermore, it was found in larger quantities when the toxicity of the nearby mussels was greater. Experiments showed a constant relation between the number of Gonyaulax in mussels and the amount of poison as measured in mouse units. The number of Gonyaulax per lethal mouse dose of poison was found to be about 3,000, from which it was calculated that the poison content of the Gonyaulax is of the order of 1 per cent of its weight. A simplified procedure for the demonstration of this poison in the plankton was devised in 1935, with which the poison can definitely be demonstrated in relatively small numbers of Gonyaulax.

Some bivalves other than mussels may become strongly poisonous. Three persons died in 1929 after the ingestion of Washington clams (Saxidomus nuttallii). Tests with various parts of the clam demonstrated that the poison is concentrated in the liver. The fact that the large clams are almost always cleaned of the viscera before cooking explains why clam poisoning is rare. A trace of the mussel poison has been found in other invertebrates (starfish, limpet and chiton), although in the experiments conducted it did not appear that these animals contained as much of the toxin as the mussels. While the toxicity curve of

1. Meyer, K. F.; Sommer, Hermann, and Schoenholz, P.: Mussel Poisoning, J. Prev. Med. **2**: 365 (Sept.) 1928.
2. Sommer, Hermann; Whedon, W. F.; Kofoid, C. A., and Stohler, R.: Relation of Paralytic Shell-Fish Poison to Certain Plankton Organisms of the Genus Gonyaulax, Arch. Path. **24**: 537 (Nov.) 1937. Sommer, Hermann, and Meyer, K. F.: Paralytic Shell-Fish Poisoning, ibid., p. 560.

the sand-crabs studied ran parallel to that of the mussels generally, sometimes the poison is demonstrable in crabs when it can no longer be detected in mussels.

These studies point to certain species of the genus Gonyaulax in the food supply of mussels along the western coast at certain times of the year as the source of the paralytic poison. The prevention of mussel poisoning nevertheless remains a difficult problem. It is impossible without frequent animal tests to warn of the approach of the poisoning period. The public should be informed about the consumption of shell-fish gathered from certain areas, it being pointed out especially that the livers of mussels and the broth may be very poisonous during the summer months. A more practical method of prevention would be to establish a closed mussel season during the summer months. Mussel quarantines have been established by health departments in some of the affected communities.

The treatment of mussel poisoning is symptomatic and therefore unsatisfactory. It should aim at the rapid elimination of the poison and, since the primary effect of the poison is paralysis of the respiratory center, artificial respiration should be tried in cases of severe poisoning.

Among the problems that remain are the chemical identification of the poisonous principle and the discovery of simpler methods of determining when certain shell-fish are toxic.

Current Comment

GEORGIA WARM SPRINGS FOUNDATION, INC.

Many letters are being received from subscribers requesting information concerning the Georgia Warm Springs Foundation, Inc. The foundation is a membership corporation organized on a basis which is known as "non-profit," under the laws of the state of New York. The foundation maintaining the institution at Warm Springs and the Office of Coordination at 50 East Forty-Second Street in New York City have been supported by funds from three sources: (1) revenue received from patients who are able to pay for their treatment, (2) a part of the proceeds of the Birthday Celebrations and (3) private contributions. The Georgia Warm Springs Foundation is not an endowed institution. About 110 beds are available in the Warm Springs institution, one half of them devoted to people who are able to pay the full cost of their treatment, one fourth for those able to pay a part of the cost of their treatment and one fourth for those unable to pay anything whatever toward their treatment. Thus some patients are admitted who are unable to pay any part of their cost and some are treated for part pay. The regular rates of the institution indicate a basic weekly payment of $22, which includes supervision, physical therapy in the pools, the services of the various attendants and walking instruction. Not included and charged for as separate charges are the fees for the initial examination of every patient made by the attending physician on arrival, orthopedic appliances such as braces, shoes and corsets, wheel chair rental (at 25 cents a week), extra surgical care and an education fee for children in the schools varying from $5 a week for the lower grades to $1 an hour for the higher grades. The charge for maintenance varies from $17 to $30 a week per patient, and special attendants are charged for at rates of from $15 a week to $30 a month. Persons who visit the institution to be with relatives and friends pay from $25 to $40 weekly for their accommodations. Approximately 125 employees are in attendance at the Georgia Warm Springs Foundation. The first Roosevelt Birthday Balls in 1934 netted $1,003,000, the next $803,000, and those for 1936 and 1937 $353,000. Of this total $2,159,000, according to available reports, $809,000 was retained in the cities in which the money was raised and $241,000 was assigned for medical research. The remainder was turned over to the Georgia Warm Springs Foundation. All the proceeds from the celebration of the President's birthday this year will be turned over to the National Foundation for Infantile Paralysis.

THE SPLEEN IN THROMBOCYTOPENIC PURPURA

Troland and Lee,[1] working in the Department of Surgery of the Johns Hopkins University School of Medicine, have found, according to a report just published, that the spleens from three patients with thrombocytopenic purpura contained a substance which has the property of reducing the platelet count in the circulating blood of normal rabbits as much as 90 per cent. The spleens investigated were taken directly from the operating room and ground in a food chopper. To this material in a rubber sealed jar was added twice its volume of reagent acetone. The jar was shaken occasionally for several days; after about two weeks the supernatant fluid was filtered away and the acetone distilled off, leaving a small amount of a thick brownish material deposited on the walls of the distilling flask. After 100 cc. of distilled water had been added, the flask was shaken vigorously so that as much as possible of the brown substance was taken up by the water. The filtrate, which was yellowish brown and cloudy, did not show a precipitate after standing in the icebox for weeks. Twenty cubic centimeters of the first preparation was injected into the ear vein of a rabbit. At the end of twenty-four hours the platelet count was reduced from the preinjection level of 620,000 per cubic millimeter of blood to 58,000. The count returned to normal in thirty-six hours. At the height of the reduction in platelets, the bleeding time was greatly prolonged. The extract from the second thrombocytopenic spleen produced a platelet drop from 640,000 to 20,000 in twenty-four hours and from the third from 610,000 to 100,000 in the same length of time. Later, it was found that 5 or even 3 cc. would produce almost as much thrombocytopenia as the much larger amounts. Repeated injections of the extract caused the platelet count to remain at about 70,000 for a period of about

1. Troland, C. E., and Lee, F. C.: A Preliminary Report on a Platelet-Reducing Substance in the Spleen of Thrombocytopenic Purpura, Bull. Johns Hopkins Hosp. **62**: 85 (Jan.) 1938.

nine days, and continued administration (there were only about four injections given) might have maintained this low count for a longer period. Four control extracts made in a similar manner were used (thyroid tissue, myomatous uterus, a spleen from a patient with Banti's disease and a spleen from a patient with hemolytic jaundice). Virtually no decrease in the number of platelets was noted following the injection of these respective extracts. The authors suggest the term "thrombocytopen" for the as yet chemically unidentified substance present in the spleens of thrombocytopenic patients. Obviously this fundamental observation not only establishes a scientific basis for splenectomy in persistent thrombocytopenia but also opens the way toward new studies which may abolish the use of the word "idiopathic" in such cases.

DANGERS OF SODIUM PERBORATE IN THE MOUTH

Dentists have long recognized the wholesale abuse of perborates and the attendant dangers, of which the general and medical public have been largely ignorant. The most prominent ingredient used in recent years in dentifrices and mouthwashes for antiseptic purposes is sodium perborate. This has been inspired, no doubt, by its alleged efficiency in combating Vincent's infection. Aside from the fact that its general use in self medication has often delayed the adequate care of such constitutional diseases as pernicious anemia, leukemia and scurvy, the possibilities of local harm have been underestimated. Now comes a study, based on the questionnaire method, by Isador Hirschfeld,[1] chairman of the Committee on Scientific Investigation of the American Dental Association. According to the clinical observations recorded in the questionnaires, perborate in solution, as a mouthwash in powder form, as a dentifrice, as a principal component of a tooth paste or as a powder superimposed on the tooth paste in brushing may cause (1) painful chemical burns of the oral mucosa (including the gingivae); (2) less painful or entirely painless burns producing a milky-white discoloration, especially of the marginal gingivae; (3) an inflamed condition of the oral mucosa, which predisposes the gingivae and mouth generally to ready abrasion and infection through minimal traumatization, and (4) a form of "hairy tongue" which in some instances causes gagging or irritation of the soft palate and pharynx. Ample examples of the danger of this form of self medication have now been recorded and adequate proof offered. Furthermore, it has yet to be established that the daily use of sodium perborate in any form is of any real value in the prevention of Vincent's infection or its recurrence. Once again the danger of self medication with active drugs has been shown; once again the unscientific advertising of substances properly belonging in the field of dentistry or medicine has proved a danger to health. How long must such examples be multiplied before the public receives protection from unenlightened commercialism?

1. Hirschfeld, Isador: Pathologic Conditions Associated with the Use of Sodium Perborate, Observed by Members of the American Academy of Periodontology. The Toothbrush—Its Use and Abuse, Dental Items of Interest, July 1937, p. 662; October 1937, p. 927.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Board Rules for License to Practice Amended.—The Alabama State Board of Medical Examiners recently amended its rules governing the issuance of certificates of qualification to practice medicine in Alabama. After the collegiate year 1938, any applicant will be required to serve at least one year of internship before a certificate will be issued. Although the applicant will be permitted to take the examinations, the certificate will be withheld until he completes the internship. In the case of graduates of European schools, the amendments provide that the applicant must present a certified statement from the National Board of Medical Examiners of the United States stating that he has successfully passed all examinations required by the board and either present a certificate of qualification to practice medicine issued in the country of his nativity or in the country in which the medical school from which he graduated is located, or a certificate stating that he has satisfactorily passed the federal examinations necessary to obtain licensure in the country in which the medical school from which he graduated is located. The rules also provide that all foreign-born applicants shall present at least first citizenship papers.

ARIZONA

Graduate Courses on Maternal and Child Welfare.—The Arizona State Medical Association and the state board of health are cooperating in a series of graduate courses on maternal and child welfare for physicians throughout the state. Courses are scheduled to be held in the Santa Rita Hotel, Tucson, February 14-19; in the Adams Hotel, Phoenix, February 21-26, and at Prescott in May. Drs. LeRoy A. Calkins, Kansas City, Mo., professor of obstetrics and gynecology, University of Kansas School of Medicine, and Julian D. Boyd, associate professor of pediatrics, State University of Iowa College of Medicine, Iowa City, will conduct the courses at Tucson and Phoenix.

CALIFORNIA

Another Human Death from Rabies.—A postman in Los Angeles County was bitten above the left ankle by a dog about Oct. 21, 1937. Only tincture of iodine was applied. December 2 he showed symptoms suggestive of rabies and was taken to a hospital, where he died December 3. A few days before entrance to the hospital, the patient complained of pain and numbness in the hands, arms, feet and legs. Tests on brain tissue were positive for rabies. According to the *Weekly Bulletin* of the state department of health, this is the third human death from rabies in Los Angeles County since June 1937. More than 2,000 rabid animals were discovered in the state during the year and quarantines against dogs are in effect in at least two counties of the state, it was reported.

Society News.—The Alameda County Medical Association was addressed in Oakland, January 17, by Drs. Eugene H. Benson Jr., Berkeley, on "Early Diagnosis of Peripheral Vascular Disease"; Olin H. Garrison, "Late Lesions in Peripheral Vascular Disease," and Warren B. Allen, "Cerebrovascular Accidents."——Dr. Frank R. Ober, Boston, discussed "Low Back Pain" before the Hollywood Academy of Medicine January 20.——The Los Angeles County Medical Association was addressed January 25 by Drs. Alfred Bielschowsky, Hanover, N. H., on "Strabismus in Children"; John O. McReynolds, Dallas, Texas, "Ophthalmology and the General Practitioner," and Arthur W. Proetz, St. Louis, "Treatment of Sinus Disease in the Light of Modern Knowledge." Dr. Siegfried Thannhauser, Boston, addressed a joint meeting of the society and the internal medicine section January 20 on "The Physiology of Liver Metabolism as a Basis for Liver Function Tests and Diet Treatment."

CONNECTICUT

Personal.—Dr. Arthur J. Couture, Moosup, has been appointed health officer of Sterling for a term of four years, and Dr. George S. Lambert has been named to a similar position in the borough of Danielson and acting health officer of Killingly.

Society News.—Dr. Jerome P. Webster, New York, addressed the Bridgeport Medical Association December 7 on "The Application of Plastic Surgery Principles in General Surgery." Dr. Louis H. Nahum, New Haven, discussed coronary arteries from the clinical standpoint with especial reference to prognosis at a meeting November 9.——Wendell M. Stanley, Ph.D., Princeton, N. J., discussed "Isolation and Properties of Virus Proteins" before the Yale Medical Society December 8.——Dr. Raymond A. Vonderlehr, U. S. Public Health Service, addressed a public meeting at the West Middle School, Hartford, February 2, on "Recent Progress in the Control of Syphilis." The lecture was under the auspices of the Hartford Board of Health.

IDAHO

Society News.—Dr. Ben C. Eisenberg, Pocatello, addressed a meeting of the Pocatello Medical Society, January 6, on "Subacute Bacterial Endocarditis." At this meeting Dr. James O. Cromwell, medical superintendent of the state mental hospital at Blackfoot, appointed the following staff to attend regular meetings at the hospital and conduct clinical work: Drs. Abram M. Newton, orthopedics; Joseph V. Clothier, ophthalmology; Casper W. Pond, otolaryngology; Edward N. Roberts, surgery, and Richard P. Howard, internal medicine.

ILLINOIS

Convalescent Measles and Scarlet Fever Serum.—A series of clinics are being held by the state department of health and the Samuel Deutsch Serum Center, Chicago, to obtain convalescent serum to combat the current near-epidemic waves of scarlet fever and measles in Illinois, according to a release from the state department. Clinics have already been held in Peoria January 27, Hillsboro February 1 and Quincy February 3. Others will be held at Moline, Kewanee, Elgin, Alton, Springfield and other places. Healthy persons more than 14 years of age who have recently recovered from measles or scarlet fever are acceptable as donors, each of whom will be paid $5. Four fifths of the serum will be retained by the Samuel Deutsch Serum Center at the Michael Reese Hospital, Chicago, where any physician of the state can obtain either measles or scarlet fever convalescent serum at cost. The remaining fifth will be left for free local use in each community where a clinic is held. About 400 new cases of measles and about 100 of scarlet fever are being reported daily in the state, and indications are that both will continue at a high prevalence level for several weeks.

Chicago

Ludvig Hektoen Lecture.—The fourteenth Ludvig Hektoen Lecture of the Frank Billings Foundation of the Institute of Medicine of Chicago will be delivered by William C. Rose, Ph.D., professor of biochemistry, University of Illinois, February 25 at the Palmer House. The title of the lecture is "The Physiology of Amino Acid Metabolism."

Branch Meetings.—Dr. Walter C. Alvarez, Rochester, discussed "Useful Hints in the Treatment of Indigestion" before the Aux Plaines Branch of the Chicago Medical Society January 29. The South Chicago Branch was addressed January 25 by Drs. David S. Hillis and Philip A. Daly on "Indications for Forceps" and "The Heart in Pregnancy." Dr. George G. Ornstein, New York, discussed "Pathogenesis of Tuberculosis and Its Prognostic and Therapeutic Implications" before the North Shore Branch February 1 and Dr. Pol N. Coryllos, New York, "Some of the Newer Aspects of Surgery of the Chest." At a meeting of the North Side Branch February 3 Drs. Oswald H. Robertson spoke on "Lobar Pneumonia, with Special Reference to Serum Therapy" and Paul S. Rhoads, Evanston, Ill., "Treatment of Upper Respiratory Infections." Dr. Anthony J. Linowiecki, as the after dinner speaker, discussed "Some Impressions of Medical Practice in Russia and Poland."

INDIANA

Personal.—Dr. John C. Glackman, Rockport, has been appointed health officer of Spencer County.——C. B. Blakeslee, D.O., Indianapolis, has been appointed a member of the state board of medical registration and examination, succeeding E. O. Peterson, D.O., La Porte, who recently resigned.

Society News.—A symposium on sulfanilamide was presented before the Indianapolis Medical Society January 18 by Drs. Gerald F. Kempf, William Niles Wishard Jr. and Matthew Winters. The society was addressed January 25 by Drs. Joseph W. Ricketts and Murray N. Hadley on the diagnosis and surgical treatment, respectively, of carcinoma of the rectosigmoid.

IOWA

Scarlet Fever Most Prevalent Disease in 1937.—The state department of health reported that scarlet fever with 7,860 cases was the most prevalent disease in Iowa during 1937. There were ninety-four deaths, the highest total from this cause since 1923.

Forum on Venereal Disease.—The question "How Can We Conquer Venereal Disease?" was discussed in a public forum at the Hoyt Sherman Place, Des Moines, January 30. Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, opened the forum with an address on syphilis. The event was sponsored by the department of adult education of the Des Moines Public Schools and Dr. Harry E. Ransom, health commissioner of Des Moines, in cooperation with the state department of health and the Polk County Medical Society.

KANSAS

Joint Educational Program.—The Kansas State Tuberculosis and Health Association at a meeting December 30 agreed to join with the committee on control of tuberculosis of the Kansas Medical Society and the state board of health in sponsoring an educational program on tuberculosis. The tuberculosis association will contribute $600 toward financing the program, according to the state medical journal.

Society News.—At a meeting of the Labette County Medical Society in Parsons, December 22, Dr. James T. Naramore, Parsons, spoke on mental diseases and Dr. Edgar C. Duncan, Fredonia, medical organization.——Dr. Frank L. Feierabend, Kansas City, Mo., discussed "Skeletal Traction as a Therapeutic Measure" before the Butler-Greenwood County Medical Society at El Dorado December 10.——The Cowley County Medical Society was addressed at Arkansas City December 9 by Dr. Grover G. Whitley, Douglas, on "The Butler County Plan."——At a meeting of the Golden Belt Medical Society in Abilene, January 6, the speakers included Drs. Brian B. Blades, St. Louis, on "Thoracic Surgery" and Archibald J. Brier, Topeka, "Photography in Medicine."——The Meade-Seward County Medical Society is showing a series of lay educational motion pictures. The first, on hernia operations, was shown January 7 at the Liberal High School with Dr. Albert L. Hilbig, Liberal, in charge of the program. Appendix operations will be the subject for the February program with Dr. Waldo N. Lemmon in charge; the correction of crossed eyes will be shown in March under the direction of Dr. William T. Grove.

KENTUCKY

Society News.—Drs. George Ezra Titsworth, Bandana, and Blanton E. Russell, Clinton, addressed the Ballard-Carlisle-Hickman Counties Medical Society in Arlington, December 7, on progress of medicine and surgery in the past fifty years and epidemic meningitis, respectively.——Speakers before the Jefferson County Medical Society, Louisville, January 17, were Drs. David Y. Keith, on "The Physics of Radium Therapy"; Robert L. Kelly, "The Use of Radium and X-Rays in Skin Lesions," and Jesshill Love, "Results of Radium Treatment of Carcinoma of the Cervix"; all are of Louisville.——Dr. Russell L. Haden, Cleveland, delivered an address at the annual meeting of the Louisville Medico-Chirurgical Society, January 14, on "Early Microscopes and Early Microscopists."——Dr. James H. Hendren, Pineville, addressed the Bell County Medical Society, Middlesboro, January 14, on "The Doctor Before the Jury."

MASSACHUSETTS

New England Obstetrical and Gynecological Society.—Dr. Bertram H. Buxton, Providence, R. I., was elected president of the New England Obstetrical and Gynecological Society at its ninth annual meeting in Boston December 1. Dr. Thomas Almy, Fall River, was chosen vice president and Dr. John G. Walsh, Providence, R. I., secretary. The program included ward visits and clinics. Among the speakers were the following, all of Boston:

Dr. Max Davis, Practical Aspects of Endocrine Therapy in Obstetrics and Gynecology.
Dr. Edwin W. Smith, Personal Experience of the Low Cervical Cesarean Section.
Dr. Samuel R. Meaker, The Place of the Classical Cesarean Section.
Drs. James C. Janney and George Levene, Transuterine Sterilization.

Horace Z. Landon addressed the banquet in the evening on "Modern Germany from a Yankee Viewpoint." A prize of $250, which was established at the 1936 meeting to be awarded annually for the best article on either an obstetric or a gynecologic subject, was presented to Dr. Howard N. Simpson, Waltham, for his essay on "The Role of Venous Pressure in Eclampsia."

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MINNESOTA

Sentenced for Illegal Operation.—Myrtle L. Brandenburg pleaded guilty January 6 in the district court of Hennepin County to an indictment charging her with manslaughter in the first degree and was sentenced to a term of from five to twenty years at hard labor in the women's reformatory at Shakopee. Mrs. Brandenburg, who holds no license to practice any form of healing in Minnesota, performed a criminal abortion on a 27 year old married woman, who died from the effects of the abortion Nov. 23, 1937. She admitted having performed other abortions, stating that she received $25 apiece for a few of them but that most of the time she received from $5 to $10 for each abortion.

Society News.—Dr. J. Henning Waldenström, Stockholm, Sweden, gave a lecture at the Mayo Clinic, Rochester, under the auspices of the Mayo Foundation January 6 on "The Etiology of Arthritis Deformans of the Hip."——Dr. Fremont A. Chandler, Chicago, discussed "Response of Bone to Circulatory Changes" before the Hennepin County Medical Society January 10 in Minneapolis. The society was addressed January 12 by Dr. Wesley W. Spink on "Streptococcic Infections"; January 19, Dr. Owen H. Wangensteen, "Management of the Undescended Testis," and January 26, Drs. Ralph T. Knight and Hamlin A. N. Mattson, "Peridural Anesthesia" and "Surgery of the Common Duct Stones: Recent Developments" respectively.——At a meeting of the Scott-Carver County Medical Society in Shakopee, January 11, Drs. Willard D. White and Owen F. Robbins, Minneapolis, discussed "Treatment of the More Common Fractures" and "Problems in Prenatal Care" respectively.

MONTANA

Twenty-Five Years as State Health Officer.—Dr. William F. Cogswell, Helena, was honored at a dinner January 17 celebrating his completion of twenty-five years as health officer of Montana. Dr. Louis H. Fligman, Helena, former president of the Medical Association of Montana and of the Montana State Board of Health, presided at the dinner. Dr. Cogswell, who is 69 years of age, graduated in 1894 from Dalhousie University Faculty of Medicine, Halifax, N. S. His efforts were largely responsible for the establishment of the Rocky Mountain spotted fever laboratory at Hamilton, which was later taken over by the U. S. Public Health Service.

NEW YORK

Estate Donated to Tuberculosis Society.—The Saranac Lake Society for the Control of Tuberculosis received as a gift in December a large estate on the Saranac River overlooking Lake Flower. The estate consists of a house with twenty rooms, two stables, a garage and servants' quarters. It was formerly the property of John Rumsey of New York and was deeded by Harmon S. Auguste, New York, holder of a $15,000 mortgage on the property. The society's plans for use of the gift have not been announced.

Society News.—Dr. Ralph J. McMahon, Johnson City, addressed the Broome County Medical Society, Binghamton, January 11, on "Cardiovascular Emergencies and Their Management."——Dr. George P. Berry, Rochester, addressed the Medical Society of the County of Albany, January 26, on "The Nature of Filtrable Viruses and Their Role in Clinical Medicine."——Dr. Myron Metzenbaum, Cleveland, addressed the Buffalo Otolaryngological Society January 18 on "Effects of the Normal Cartilaginous Septum on the Anatomical Development of the Nose, Jaws, Sinuses and Teeth."

New York City

Clinical Session on Tuberculosis.—The Tuberculosis Sanatorium Conference of Metropolitan New York will hold its thirteenth clinical session on chronic pulmonary diseases February 9 at Cornell University Medical College, with addresses by Drs. Julius P. Dworetzky, Liberty, on "Tuberculosis of the Larynx"; Emil Granet, "Tuberculosis of the Intestines," and Clarence G. Bandler, "Tuberculosis of the Genito-Urinary Tract."

New York University Offers Course on Syphilis.—A program of graduate study in syphilis has been arranged at New York University College of Medicine to extend from February 15 to June 15 in cooperation with the U. S. Public Health Service and the New York State Department of Health. The course is intended primarily for physicians working in state and local health departments, but other physicians may be accepted. Physicians at present engaged in health department work may apply either to the office of the dean at the College of Medicine, 477 First Avenue, or through their state health departments. Others should apply directly to the college.

Medical Exhibits at the Fair.—Fifty sections are to be included in the medicine and health building of the New York World's Fair 1939, showing menaces to man's physical welfare and safeguards against them, according to a recent announcement. The health building, which is now nearing completion on the fair site near Flushing, will be dominated by the Hall of Man. The central feature of the hall will be an eighteen foot transparent man surrounded by life size models illustrating the processes of respiration and digestion, the functions of the eye and ear and the processes of growth and reproduction. There will be individual exhibits on cancer, tuberculosis, diabetes, diseases of the blood, pneumonia, allergy, epidemiology and heart disease, sponsored by various groups and by manufacturing firms. A demonstration of the details of hospital care, including hospital administration and finance, will also be shown, with adjacent exhibits on roentgenology, anesthesia and analgesia.

NORTH CAROLINA

Foundation Provides Funds for Syphilis Campaign.—Income from the $7,000,000 Zachary Smith Reynolds Foundation will be used exclusively to finance a campaign against syphilis in North Carolina, it was recently announced by trustees of the foundation established in 1936 in memory of the late Zachary Smith Reynolds of the Reynolds tobacco family. The income will amount to more than $100,000 a year, it was said, and this amount has already been presented to the state board of health for the first year's work. As a result of an appropriation of $25,000 by the last general assembly, the state now has sixty-seven clinics for venereal disease in operation. The new fund will be used to expand about twelve of these in the more populous counties. A clinic on wheels, consisting of a motor truck fitted as a physician's office and accompanied by a doctor and a trained nurse, will be operated in rural districts as one of the first projects, and others will be added if one proves successful. Drugs for treatment will be supplied by the board of health in all clinics and also to physicians who cooperate in the program. Dr. Carl V. Reynolds, Raleigh, state health officer, is in charge of planning the campaign.

OHIO

Medicomilitary Refresher Course.—A ten week refresher course for members of the U. S. Army Medical Reserve Corps in the fifth corps area was begun January 26 and will continue on Wednesdays to March 30 at the University of Cincinnati College of Medicine. It was announced that Perceval S. Rossiter, surgeon general of the U. S. Navy, would be a guest for the course March 16.

Dr. Upham Honored.—Dr. John H. J. Upham, Columbus, President of the American Medical Association, was honored at a dinner and reception given January 21 by the president and administrative council of Ohio State University to four deans in the university who are serving as presidents of national professional associations. Besides Dr. Upham, dean of the school of medicine since 1927, those honored were Harry Semans, D.D.S., college of dentistry, president of the American Association of Dental Schools; Oscar V. Brumley, D.V.M., college of veterinary medicine, president of the American Veterinary Medical Association, and Herschel W. Arant, LL.B., college of law, president of the American Association of Law Schools.

Industrial Hygiene Survey.—The bureau of occupational diseases of the state department of health is to direct a survey of Ohio industries to obtain information concerning health conditions of workers, *Ohio Health News* announces. An average random sample of manufacturers, of the mechanical and mining industries and of three service groups has been selected for the survey, in which the safety, medical and other welfare provisions for employees will be recorded, as well as the health hazardous occupational exposures. The surveyors and engineers selected for the work will attend a special training course at Columbus, given by Mr. J. J. Bloomfield, safety engineer of the U. S. Public Health Service, before undertaking their investigations.

Society News.—The Public Health Federation of Cincinnati celebrated its twentieth anniversary at a dinner December 15, with Dr. William A. O'Brien, associate professor of pathology and preventive medicine and public health, University of Minnesota Medical School, Minneapolis, as the guest speaker.——"Advances in Medicine During 1937" were reviewed at a meeting of the Montgomery County Medical Society, Dayton, February 4, by Drs. Harry E. King, Sherl J. Winter and Elias C. Fischbein.

PENNSYLVANIA

Society News. — Drs. William J. Fetter and Mark M. Bracken, Pittsburgh, addressed the Westmoreland County Medical Society, Scottsdale, January 25, on "Early Diagnosis and Treatment" and "Typing of Pneumococci" respectively.

Obstetric Institute.—The second annual institute in obstetrics and pediatrics of the Dauphin County Medical Society, arranged by the maternal and pediatric welfare commission of the state medical society, was held at the Harrisburg Academy of Medicine February 2. The speakers on obstetric subjects were Drs. Newlin F. Paxson, Harry Stuckert and John C. Hirst; those on pediatrics, Drs. John C. Gittings, Milton Rapoport and Edward S. Thorpe, all of Philadelphia.

Philadelphia

Dr. Henry H. Donaldson Dies.—Henry Herbert Donaldson, Ph.D., professor of neurology, Wistar Institute of Anatomy and Biology, died of pneumonia January 23, aged 80. A native of Yonkers, N. Y., Dr. Donaldson was educated at Yale University and at Johns Hopkins University, from which he received his doctorate in 1885. He taught for several years at Johns Hopkins and at Clark University, Worcester, Mass., and from 1892 to 1906 was professor and head of the department of neurology at the University of Chicago. During the first six years of the latter period he was dean of the Ogden Graduate School of Science at Chicago. He was appointed to Wistar Institute in 1906. Dr. Donaldson was a member of numerous scientific organizations and had served as president of the American Association of Anatomists (1916), the American Society of Naturalists (1927) and the American Neurological Association (1937). In 1895 he pubiished a book on "Growth of the Brain" and in 1915 one on "The Rat, Data and Reference Tables." Yale University honored him with the honorary degree of doctor of science in 1906 and Clark University in 1937. In 1932 the June issue of the *Journal of Comparative Neurology*, published at the Wistar Institute, was dedicated to Dr. Donaldson in honor of his seventy-fifth birthday.

Pittsburgh

Society News.—At a meeting of the Allegheny County Medical Society January 18 the speakers were Drs. Yale D. Koskoff, on "Acute Spinal Epidural Abscess"; William J. Fetter, "Hyperthyroidism"; Henry M. Ray, "Application and Interpretation of Clinical Laboratory Procedure to the Daily Problems of General Practice"; Cornelius C. Wholey, "Psychic Dissociations Peculiar to Major Hysteria," and Ford M. Summerville, Oil City, "Injuries and Repairs of the Brachial Plexus and Nerve Supply of the Arm." —— Drs. James O. Wallace and William A. Bradshaw addressed the Pittsburgh Academy of Medicine, January 25, on "Fractures of the Cervical Spine" and "Exudative Esophagitis—Medical and Surgical Treatment" respectively.

TENNESSEE

Mid-South Post Graduate Assembly. — The fifty-third annual session of the Mid-South Post Graduate Assembly will be held in Memphis February 15-18 at the Hotel Peabody under the presidency of Dr. Carl R. Crutchfield, Nashville. Among the speakers will be:

Dr. Louis A. Buie, Rochester, Minn., Diseases of the Anus and Rectum: Diagnostic and Therapeutic Aspects.
Dr. Joseph E. Moore, Baltimore, Public Health Implications of the Treatment of Syphilis.
Dr. James H. Means, Boston, Treatment of Some of the Commoner Medical Emergencies.
Dr. Albert Graeme Mitchell, Cincinnati, Commonplace Endocrine Problems of Childhood.
Dr. Harvey B. Stone, Baltimore, Further Reports on Cross Grafting of Endocrine Glands.
Dr. Gabriel Tucker, Philadelphia, Cancer of the Larynx: Its Management and Its Relation to Benign Tumors of the Larynx.
Dr. Esmond R. Long, Philadelphia, Types of Pulmonary Tuberculosis and Factors in the Spread of Disease.
Dr. Sidney D. Kramer, New York, An Evaluation of a Number of Procedures Recommended for Prevention of Poliomyelitis.
Dr. Russell L. Haden, Cleveland, Treatment of Anemia.
Dr. Ramon Castroviejo, New York, Surgery of the Cornea.
Dr. George W. Kosmak, New York, Favorable and Unfavorable Results from the Practice of Certain Modern Obstetric Trends and Procedures.
Dr. Alexis F. Hartmann, St. Louis, The Use of Sulfanilamide in the Treatment of Infections.

HAWAII

Epidemic of Measles.—The Territory of Hawaii recently experienced the severest and most virulent epidemic of measles in its recorded history, according to *Public Health Reports* December 17. The last previous outbreak of measles in Hawaii occurred in the spring of 1932 and was followed by a period of four years of unusually low prevalence, when the number of reported cases averaged less than ten per month. In October 1936 sixty-seven cases were reported, in November 384 and in December 1,289. The epidemic reached its peak in March 1937, when 2,558 cases were reported. The number of reported cases from November 1936, when the epidemic first started, until September 1937, when it was practically over, equaled the number reported during the preceding twenty years. The outbreak was accompanied by a high mortality, the number of deaths from measles during the first three months of 1937 exceeding that from any cause except heart disease and pneumonia; the respective rates per hundred thousand of population were 102, 110 and 125. For the first six months of 1937 the rates were 81 for measles, 101 for pneumonia and 118 for heart disease. The epidemic had decreased so that the death rate for the first nine months was 55.

PHILIPPINE ISLANDS

University News.—Dr. Eugenio B. Hernando, director of the bureau of health, Manila, has given to the medical library of the University of the Philippines a collection of medical books and journals reported to be worth 10,000 pesos.

GENERAL

Documentation Institute Selects Director.—Mr. Cuthbert Lee, New York, has been chosen the first director of the American Documentation Institute, established in March 1937 for the production of microfilms of scientific literature. Mr. Lee is a graduate of Harvard University and has recently been engaged in banking and publishing activities in New York. He is the author of a history of early American portrait painters. As director of the institute he will have charge of the operating activities, which include microfilming in the library of the Department of Agriculture, the Library of Congress and the Army Medical Library at Washington, D. C., and the distribution of research results through the medium of microfilm in cooperation with scientific and scholarly journals. The institute is a nonprofit organization with a membership nominated by about fifty societies, institutions and agencies. It has now taken over the activities of microfilming initiated by the documentation division of Science Service, which began in 1934 with literature in the Department of Agriculture and have been extended to the Library of Congress and the Army Medical Library within the past few months. The institute will not design or distribute apparatus, but for a limited time Science Service will distribute the reading machine. Financial support for development of the institute has been extended by the Chemical Foundation and the Rockefeller Foundation. Watson Davis, director of Science Service, is president of the institute.

Changes in Status of Licensure.—The Kansas Medical Board of Registration and Examination announces the following:

Dr. James Louis Ransom, Topeka, license restored December 14.

The Indiana State Board of Medical Registration and Examination reports the following:

Dr. George H. Espenlaub, Evansville, license revoked November 16, for his conviction of assault and battery with intent to commit a felony.

The Alabama Board of Medical Examiners reports the following:

Dr. Sidney J. Burnum, Scottsboro, license revoked October 29, for violation of the Harrison Narcotic Act.

The New York State Board of Medical Examiners recently reported the following action:

Dr. Everett H. Winter, whose last known address was 184 Hillside Avenue, Hollis, Long Island, N. Y., license revoked.

Bequests and Donations. — The following bequests and donations have recently been announced:

University of Cincinnati College of Medicine, $20,000 by the will of Miss Rebecca Scarborough; half the income is to be used for the department of general surgery and half for the department of internal medicine.

Nine public institutions will receive about $713,000 by the will of Robert James Edlitz on the death of his widow; Presbyterian and New York hospitals are to receive one fifth each of this amount; Roosevelt Hospital, Hospital for the Ruptured and Crippled, Cornell University and the Dobbs Ferry Hospital, four sevenths of the remainder.

Jewish Hospital, Brooklyn, and St. Anthony's Hospital, Woodhaven, N. Y., $1,000 each by the will of Mrs. Babette E. Sauler.

Mansfield General Hospital, Mansfield, Ohio, $25,000 by the will of Richmond Smith.

Methodist Episcopal Hospital, Philadelphia, $5,000 by the will of the late Melville Gambrill.

New York Skin and Cancer Hospital, $10,000 by the will of Miss Susan Stewart Miles.

Montefiore Hospital, New York, $5,000, and the United Hospital Fund, New York, $2,000, by the will of Solomon G. Rosenbaum.

Hospital for Ruptured and Crippled, $15,000; Presbyterian Hospital, $10,000; Flower Hospital, $7,500, and Knickerbocker Hospital, one ninth of the residuary estate of Miss Annie Miller. All are in New York.

Lenox Hill Hospital, New York, $12,500 from the estate of the late Josephine Schumann.

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Annual Radiologic Conference.—The eighth annual conference of the American College of Radiology will be a joint session with the Conference of Teachers of Clinical Radiology at the Palmer House February 13. The program will follow a luncheon at 12:30 o'clock to which all radiologists and teachers are invited. Reservations should be made with the secretary, Mr. Mac F. Cahal, 2561 North Clark Street, Chicago. Speakers will include:

Mr. Cahal, The Program of the Inter-Society Committee for Radiology.
Dr. William Edward Chamberlain, professor of radiology and roentgenology, Temple University School of Medicine, Philadelphia, The Radiologist's Bill for Professional Services.

Following a dinner at 6:30 for teachers of clinical radiology, the following will present papers:

Dr. Ross Golden, professor of radiology, Columbia University College of Physicians and Surgeons, New York, Responsibility of the Radiologists in the Training of the Hospital Intern in Fluoroscopy.
Dr. Byrl R. Kirklin, associate professor of radiology, University of Minnesota Graduate School of Medicine, Rochester-Minneapolis, and secretary of the American Board of Radiology, The Responsibility of the American Board of Radiology for Setting Up and Maintaining Standards in Radiologic Education.
Dr. Benjamin H. Orndoff, professor of radiology, Loyola University School of Medicine, Chicago, The Bedside Manner in Radiology.

Northwest Regional Conference.—The annual Northwest Regional Conference will be held at the Palmer House, Chicago, February 13, under the presidency of Dr. Roscoe L. Sensenich, South Bend, Ind. The general subject of the conference will be "Medical Care for All the People." At the morning session the following program will be presented:

Dr. Herman M. Baker, Evansville, Ind., Preventive Medical Care as an Activity of County Medical Societies.
Dr. Raymond G. Arveson, Frederic, Wis., Rural Medical Care in Wisconsin.
Mr. Joe W. Savage, Charleston, W. Va., executive secretary, West Virginia State Medical Association, Physical Rehabilitation of the Indigent.
Dr. Raymond G. Tuck, Pontiac, Mich., Oakland County Medical Plan.
Dr. Carl F. Vohs, St. Louis, Group Hospitalization in St. Louis.

The Indiana State Medical Association will be the host at luncheon, at which Dr. Sensenich will give his official report. In the afternoon "Medical Care for All the People" will be discussed by Drs. Rosco G. Leland, Chicago, director of the Bureau of Medical Economics, American Medical Association, from the point of view of the national association; Ernest E. Shaw, Indianola, Iowa, that of the state medical association, and Mr. Jack Austin, Wichita, Kan., executive secretary, Sedgwick County Medical Society, that of the county society.

CANADA

Ophthalmologists Organize.—The Canadian Ophthalmological Society was recently formed at a meeting in Toronto with the following officers: Drs. W. Gordon Matthew Byers, Montreal, president; William H. Lowry, Toronto, vice president, and Alexander E. MacDonald, Toronto, secretary.

Society News.—Dr. Sumner L. Koch, Chicago, addressed the Essex County Medical Society, Windsor, Ont., November 3, on "Injuries to the Hand."——Dr. Thomas Francis Jr., New York, was a guest speaker at the sixth annual meeting of the laboratory section of the Canadian Public Health Association in Toronto, December 20-22. Dr. Francis spoke on "The Value of Serologic Studies in Epidemic Influenza."——The Academy of Medicine of Toronto observed the semicentennial of its library at a meeting January 4. Dr. Thomas Gibson, professor of pharmacology and therapeutics, Queen's University Faculty of Medicine, Kingston, Ont., gave an account of Dr. John Robinson Dickson, first professor of surgery at Queen's University, and showed papers and letters illustrating early history of that school. Portraits and other recent acquisitions were formally presented to the library. The academy section on anesthesia had as a guest speaker January 24 Dr. William Neff, San Francisco, who spoke on "Factors Which May Influence the Amount of Bleeding During Operations under General Anesthesia, with Special Reference to Cyclopropane."——Dr. Charles E. Sears, Portland, Ore., addressed the Vancouver Medical Association February 1 on "Pathogenesis and Treatment of Vascular Hypertension."

FOREIGN

Congress on Rheumatism.—The International Congress on Rheumatism and Hydrology, convened by the International Society of Medical Hydrology and the International League Against Rheumatism, will meet in Oxford, England, March 25-31, under the presidency of Sir Farquhar Buzzard, regius professor of medicine at Oxford. The main subjects of discussion will be "Wet and Dry Climates and Weather in the Causation of Disease" and "Juvenile Rheumatism." Inquiries concerning the congress may be addressed to the General Secretary, 109 Kingsway, London, W. C. 2. Immediately after the international congress will be held the Bath Congress on Chronic Rheumatism to commemorate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases, March 31 to April 3.

Government Services

Study of Pilot Fatigue

The bureau of air commerce has requested the Aero Medical Association of the United States to appoint a special committee to begin a study on pilot fatigue. According to the *Journal of the Florida Medical Association,* Dr. Ralph N. Greene, Coral Gables, now medical director of Eastern Air Lines and medical consultant for Pan American Airways, has been appointed chairman of the committee.

Second Year Internships in Public Health Service

The U. S. Public Health Service announces that it will receive applications for positions as second year interns for appointment on or after July 1 or sooner if there are vacancies. Physicians are eligible who are not over 30 years old and who have or will have completed one year's internship following graduation at an approved hospital by next June. No written examination will be required. Candidates appointed for duty at marine hospitals or at U. S. narcotic farms will receive a gross pay of $1,800 a year, from which a deduction of $690 will be made if quarters, subsistence and laundry are furnished. Those assigned to federal penal and correctional institutions will receive $1,620 a year, from which $240 will be deducted if quarters, subsistence and laundry are furnished. Quarters, subsistence and laundry will be furnished in every instance when they are available. The quarters for an intern are designed for the use of the individual himself and cannot be shared by dependents. Appointments will be made with the understanding that opportunity will be afforded to take the next examination provided for appointment as assistant surgeon in the regular corps of the service. Persons wishing to apply should communicate at once with the surgeon general, U. S. Public Health Service, Washington, D. C., stating definitely that they are interested in a second year internship and giving the earliest date of their availability.

Examination for Regular Corps, U. S. Public Health Service

An examination to establish eligibility for appointment in the regular commissioned corps of the U. S. Public Health Service in the grade of assistant surgeon is announced. The board of examiners will convene at the following places and times to make physical examinations and to conduct the oral and general fitness part of the examination:

U. S. Marine Hospital, Boston, February 23.
U. S. Marine Hospital, New Orleans, March 2.
U. S. Marine Hospital, St. Louis, March 6.
Colorado Psychopathic Hospital, Denver, March 8.
U. S. Marine Hospital, San Francisco, March 10.
U. S. Marine Hospital, Seattle, March 14.
U. S. Marine Hospital, Chicago, March 18.
U. S. Marine Hospital, Cleveland, March 21.
U. S. Public Health Service Hospital, Lexington, Ky., March 22.
U. S. Public Health Service Building, Washington, D. C., March 28.

Candidates should arrange to appear before the board at any of these places at 9 a. m. on the dates specified. Those who pass the first portion of the examination will be permitted to participate in the written portion beginning March 30 at the place where the physical examination is conducted or at some other nearer point; or candidates may elect to go to Washington March 28 and take the entire examination. The first part of the examination will consume one or two days, while the written and clinical portions will consume not less than five. Any travel expenses must be defrayed by the candidate. Applicants must not have passed their thirty-second birthdays on the date the examination is taken, must be citizens of the United States, must be graduates of class A medical colleges and must have completed at least one year of internship or its equivalent since graduation. Application blanks may be obtained by writing to the surgeon general, U. S. Public Health Service, Washington, or they may be obtained from the board at the time the applicant appears for examinations. Applicants will be required to present their diplomas to the board.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 8, 1938.

Breathing Exercises in Treatment of Asthma

In the report of the Asthma Research Council, just issued, the results of treatment by breathing exercises at King's College Asthma Clinic are described. These are carried out under the direction of Dr. J. L. Livingstone and are the only form of therapy that is being investigated from the research point of view. Dr. Livingstone holds that it is a mistake to call the distended lungs of chronic asthma emphysematous, as true emphysema depends on degeneration of the elastic tissue, which does not occur. The object of treatment is to restore the chest to normal size and prevent distention from occurring. Ordinary breathing exercises, the object of which is to increase the expansion of the chest, are useless. If an asthmatic patient is told to breathe deeply, his respiration seems almost entirely upper thoracic; the lower part of the chest is already fully expanded and remains immobile, the diaphragm being used only to a slight extent. The exercises are designed to teach the patient first to use the lower part of the chest as well as the upper and secondly to use the diaphragm more. They are mainly expiratory and the patient assists expiration by pressure with his hands on the lower part of the chest. The results obtained at the Asthma Clinic are as follows: In about 40 per cent of the cases the asthma has either disappeared or become so slight as not to inconvenience the patient. In about 30 per cent the condition is much improved and there remain some 30 per cent of failures, but in about half of these there has been failure to learn to breathe properly, either because the patients cannot pick up the knack or because they will not make enough effort. The patients have been carrying on in their usual environment and have not avoided feathers, dust or foods, to which they may be sensitive. A new edition of Dr. Livingstone's "Physical Exercises for Asthma" has been published and a special section for children has been added.

The Fauna of Filter Beds

In his annual report to the Metropolitan Water Board, Lieut.-Col. C. H. H. Harold, director of water examinations, describes two noteworthy discoveries. In the filter beds of the London water supply considerable numbers of the blind well shrimp Niphargus aquilex have been found. This is an amphipod related to the common fresh-water shrimp, from which it differs in absence of eyes. It is adapted to a subterranean existence and, like other animals which live in the dark, is devoid of pigment. Where it came from originally is a matter of conjecture, but it is clear that it has become adapted to the unnatural environment of the clear water channels of filters. Associated with Niphargus were two species of Copepods. Another amphipod discovered is Eucrangonyx gracilis, the scientific interest in which is increased by the fact that it has previously been recorded only in the United States and Canada. It has much the same bleached appearance as Niphargus aquilex but has well developed black eyes. The problems raised by these discoveries do not admit of easy solution. It is clear that a well established fauna has to be dealt with. If attacked from below it can escape into the upper levels of the ballast. The application of chloramine was only partially successful in eliminating Niphargus.

The Need for an X-Ray Museum

In a letter to the *British Medical Journal*, Dr. Douglas Webster (radiologist) refers to the signs of much activity on the part of radiologists, as shown by the flourishing condition of the British Institute of Radiology, the high attendance at the new Section of Radiology of the Royal Society of Medicine and the new British Association of Radiologists, which is about to hold examinations for a higher qualification in radiology than is represented by the diploma, and the new Society of Radiotherapists, which holds frequent and well attended meetings. But a central x-ray museum is a great want. Most large hospitals have their own local museum collections in radiology as in other subjects. A large central museum would correspond to the surgical museum of the College of Surgeons, but years would be required for such a collection to be formed. Special endowment of some existing body, such as the British Institute of Radiology or the British Association of Radiologists, would in time attain such an end. It would be a great help to teaching the subject to have under one roof a museum representative of radiology in all its aspects —historical, technical and normal varieties, with typical illustrations, clinical, pathologic and radiologic, of the various diagnostic and therapeutic uses of radiology.

Rehabilitation of the Injured

A joint committee of the British Medical Association and the Trade Union Congress has presented an important memorandum of evidence to a committee on the rehabilitation of persons injured by accident. The conclusion of the committee of the British Medical Association on fractures is first quoted: "Excellent primary treatment is of little value in many fractures unless it is followed by a phase of active exercise directed to a complete restoration of function." The memorandum next states that in the treatment of bone and joint injury a period of immobilization is almost invariably necessary, although modern methods have shortened this. At present the only method of treating the resultant joint stiffness and muscle wasting in common use is the general physical therapy of hospital massage departments. The word "rehabilitation" may be taken as applicable to the stage between the completion of the massage and exercises and the point when heavy work can be undertaken. It is difficult to ensure the necessary procedures. The surgeon has reached the limit of his facilities. He knows that in many cases graduated light work is necessary, but it is rarely available. He generally has none to offer and, as he is generally insured, is without personal interest in recovery.

The joint committee therefore recommends that rehabilitation centers should be established where physical and mental redevelopment can be achieved by games, gymnasium exercises, the swimming pool and graduated work. Group exercises, with their friendly rivalry, are more valuable than individual efforts. Occupational activities, such as the use of simple tools, lathes, belt conveyers and drilling machines, should be available. As far as possible the work should be creative. In many cases the disability may be both mental and physical and the treatment outlined would help both. But patients who have suffered profound mental disturbance, with negligible physical disability, who are the victims of traumatic neurasthenia or functional disorder, are in an entirely different category. Under no circumstances should they be treated in the ordinary rehabilitation center. If the necessary treatment is not available in general hospitals, special organizations should be established independent of the rehabilitation centers.

An essential of success in the rehabilitation centers is the personal contact between the medical superintendent and the patients. They require varied handling. One needs sympathy, another encouragement. Some must go slow, others quickly. One requires simple example, another exhortation and stimulation. The optimum size of a unit in charge of one medical superintendent is about fifty men; the most capable superintendent cannot supervise more than 100. The unit accommodating fifty patients would deal with about 600 in the year, which is the anticipated number from a fracture clinic dealing with 2,500 injuries. It could serve an industrial area with a population of a quarter of a millon. The superintendent should have

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some knowledge of orthopedics and traumatic surgery but need not be an expert surgeon. He would require special training for his work. He should have first hand knowledge of the works and the various trades and occupations in the area served by the center. There should also be a gymnasium instructor and a workshop foreman. One masseur could undertake the necessary treatments for a unit of fifty patients. An employment officer would also be required. He would maintain contact with the patient's trade union and employer and with the employment exchange. He might be able to assist during the first trial of work in giving the necessary encouragement and stimulation. The patients should live at the center. This would help them to acquire a new outlook and remove them from the harmful influence of well meaning but overindulgent relatives and friends. It is suggested that the capital cost should be borne by the government and the running costs by employers for their injured workmen.

Midwifery Service for London

The London County Council brought into operation January 1 a new domiciliary midwifery service. Every mother, irrespective of her financial circumstances, will now be able to call on the service of a qualified midwife to act as such or, if a private physician is engaged, as a maternity nurse. The full fees proposed to be charged are $10 for the first confinement and $7.50 for the subsequent ones or for maternity nursing. Reduced fees will be charged when the patient or liable relatives are unable to pay the full fees and, when circumstances justify, the whole fee will be remitted. Over 160 midwives will be employed under the scheme. The midwives will be encouraged to make the fullest use of the various maternity and child welfare services.

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Supply of Oxygen in Hospital by Pipe Line

In the Westminster Hospital, which is being rebuilt, a new method of conveying oxygen—by pipe line—has been installed. The oxygen will be supplied to points in the wards throughout the hospital and to the operating theaters. It is claimed that this new method is both more efficient and more economical than the old one.

PARIS

(From Our Regular Correspondent)

Jan. 8, 1938.

Efforts of the Profession to Take Over Public Health Work

During the past year the medical profession of Paris has been making an intensive study of whether general practitioners should take charge of all preventive medicine matters except those incident to epidemics. This study was undertaken with the idea that something must be done to prevent further inroads on private practice by medical representatives of the government, whose aim has been to make all physicians state officials and thus to socialize medicine. In the journal *Mouvement sanitaire* for September 1937 the entire question of whether preventive medicine should be assigned to practitioners or to government officials is discussed. From the standpoint of remuneration the practitioner would have little to gain, since the work of a public health official is poorly paid. The only advantage, according to Dr. Dupuy, an inspector of hygiene, who is the author of the article, is the moral effect on the practitioner, who will feel that he is not being made a state official. The profession forgets, however, that every practitioner's work in preventive medicine will necessarily be controlled by public health officials. The representatives of the profession maintain that better work will be done by the general practitioner because he is more familiar with the family history of every patient. The latter will also be better satisfied because he can choose his medical attendant instead of being obliged to go to some one designated by the government. Dr. Dupuy states that the poorer classes, who really have need of preventive medicine, change their medical attendant frequently, so that it will be difficult to keep track of them. The practitioner, when he is busy, is apt to neglect his preventive medicine duties, which have become highly specialized knowledge. Another objection is that the general practitioner will have little opportunity to enforce his recommendations, whereas the public health officer can do so.

In answering these objections to the profession at large assuming preventive medicine duties, Dr. Jean Mignon, in the Nov. 17, 1937, issue of *Concours médical*, states that only practitioners who have taken special courses qualifying them for preventive medicine work should be selected and not every general practitioner indiscriminately. An arrangement could be made exempting the practitioner from surveillance by public health officers, so that violation of professional secrecy would be excluded.

To those unaware of the inroads which state medicine has made on private practice, this question of assigning preventive medicine work to the general practitioner may seem unimportant. The question of aiding those whose work is confined to their duties as family physicians is being actively discussed here and every effort is being made by the syndicates who have charge of public relations for the profession to devise some method of conserving at least a little for the general man from the efforts of the government to socialize medicine.

Vaccination Against Diphtheria and Tetanus

The October 1937 issue of the *Annales de médecine* contains three articles by Professor Ramon of the Pasteur Institute of Paris. The first is on diphtheria toxoid and the prophylaxis of diphtheria, the second on tetanus toxoid and vaccination against tetanus, and the third on associated vaccinations. The conclusions of the first of these are that the diphtheria toxoid, or anatoxin, as it is termed here, is prepared as the result of the action of heat and formaldehyde on the specific toxin. It is a stable, nontoxic vaccine the antigenic properties of which are easily demonstrable in vitro. It is capable of producing the appearance and development of an active and durable immunity in human beings. Its application all over the world to millions of persons has proved the efficacy of the diphtheria toxoid. Its routine employment bids fair to cause diphtheria to disappear almost entirely as an acute infectious disease. Wherever its use has been made obligatory there has been a marked decrease in the morbidity and mortality rate.

The conclusions of the second paper are that the use of the tetanus toxoid is especially indicated during peace time among agricultural workers, and during war it should be associated as a prophylactic measure with the vaccination against typhoid, paratyphoid and diphtheria.

The Volkmann Syndrome in Supracondyloid Fractures of the Humerus

A Paris surgeon, Dr. Jacques Leveuf, has made a study in ten cases of the effects of contusion of the brachial artery in supracondyloid fractures of the humerus. In a paper read at the Dec. 1, 1937, meeting of the Académie de chirurgie he divided the cases into two principal types, the complete in which there is immediate paralysis of the muscles of the forearm and hand, and the incomplete in which the motor disturbances appear less marked at the onset.

In the complete type, all the muscles of the forearm and hand are paralyzed and there is coincident anesthesia of the fingers, hand and part of the forearm. The median, ulnar and radial nerves show signs of degeneration. Between the forty-fifth and the sixtieth day, retraction of the flexor muscles is to be noted, whereas the sensory disturbances and evidences of paralysis of the radial nerve disappear, resulting in the typical change in position of the fingers. The muscles supplied by the

ulnar and median nerves recover their function much more slowly and this takes place only in cases in which the termination is favorable. The author has found that the sclerosis which is responsible for the muscular retraction disappears more or less completely in the majority of cases. The prognosis depends above all on recovery from the ulnar and median nerve lesions.

The incomplete type is particularly characterized by lack of involvement of the extensors of the fingers, that is to say, of the muscles supplied by the radial nerve; hence the finger deformity is noticeable from the onset instead of appearing late as in the complete type. The prognosis of these incomplete types is much more favorable, recovery having occurred in two of four cases in less than four months, two others being still under observation but apparently following the same course as those in which recovery occurred.

The lumen of the brachial artery close to the bend of the elbow is almost invariably found to be obliterated, but there is such an ample collateral circulation that gangrene of the forearm and hand does not take place. The median and ulnar nerves appear intact on gross examination, but the author found in one case that one of the large branches revealed, on microscopic study, complete destruction of the nerve elements. It is this serious involvement of the nerve trunks which distinguishes the complete from the incomplete type. Microscopic study of the muscles in both types reveals areas of necrosis in some and extravasation with beginning fibrosis in others. There appears to be complete blocking of the capillaries. All these lesions predominate in the flexor muscles of the forearm. In general it may be said that both muscular and nerve lesions can disappear but that everything depends on the severity of the latter.

In the discussion, Dr. Etienne Sorrel said that but little progress had been made in the pathogenesis of the Volkmann syndrome and even less in its treatment, after the diagnosis of its existence has been made. The only bright spot is that it is possible to prevent its appearance if patients with supracondyloid fracture of the humerus are operated on as soon as possible after the injury.

Paralyses Following Antirabic Treatment

At the Dec. 7, 1937, meeting of the Académie de médecine a paper was read by Dr. Remlinger based on an analysis of 202 cases of paralyses following antirabic treatment, reported during the past ten years. The mortality was 32.22 per cent and the clinical pictures varied greatly. They included dorsolumbar myelitis with or without paralysis of the bladder and rectum, ascending paralysis of the Landry type, diffuse meningoencephalomyelitis, diverse neuritic localizations, facial monoplegia and diplegia, temporary retention of urine, and other accidents. These conditions occur most often following the use of either dried spinal cord or the latter treated with glycerin. They are especially severe after the use of diluted virus, giving rise to a type of fatal "laboratory rabies." The pathogenesis is not the result of a single action. In the mild or severe accidents due to dead vaccines, it is some component of the normal nervous substance which appears to be responsible. It is prudent to discontinue treatment as soon as any form of paralysis appears. The incidence is only 1: 4,000-5,000 persons who are treated; hence the potential occurrence of these forms of involvement of the nervous system is not a contraindication to the antirabic treatment.

Intravenous Injections of Alcohol for Tetanus

The failure in some cases of the intensive specific serotherapy of tetanus has led Merle, François and Jouvé of Clermont-Ferrand, in central France, to use alcohol intravenously on the theory that it will free the toxin that is fixed on the nervous tissue. They presented the results of the combined use of alcohol and antitoxin in ten cases of tetanus at the Dec. 17, 1937, meeting of the Société médicale des hôpitaux. There were seven successful results and three deaths. In the latter, death occurred several days after cessation of the contractures, in one from an infection of the gluteal region and in the other two, the patients being addicted to alcohol, from pleuropulmonary complications. The doses of serum averaged about 20,000 units a day given subcutaneously and intramuscularly because the authors regard the intraspinal route of administration as more difficult and likely to be followed by an aseptic meningitis. The alcohol was given intravenously in the form of a 33 per cent solution in 30 per cent solution of dextrose in doses of from 10 to 40 cc. daily until definite improvement was noticed. No local complications were observed.

BERLIN

(From Our Regular Correspondent)

Dec. 13, 1937.

Congress of German Dermatologists

The principal topic of this year's congress of German Dermatologists was "The Significance of Cutaneous Tests." The first principal speaker, Frieboes, dermatologist, of Berlin, pointed out that, in the reactions observed, constitution and heredity have just as important parts as nutrition and climatic conditions. Cutaneous tests are frequently based on reactivity to several substances. Frieboes discussed the phenomenon of active acquisition of a sense of desensitization to substances which otherwise elicit hypersensitization. In the second paper, Professor Miescher of Zurich called attention to the fact that the tests must parallel the course of the disease. He differentiated, on the basis of the state of cutaneous hypersensitization, an epicutaneous and an intracutaneous type of test, corresponding to the reaction of the skin: epicutaneous in eczema, intracutaneous in urticaria. The epicutaneous reactivity is subdivided into toxic and allergic types. (The toxic reaction may be presented by the normal skin if the concentration is increased, but allergic reactions are elicited only in hypersensitive persons.) Intracutaneous hyperesthetic reactions are to be traced in part to acute vascular stimuli, in part to inflammatory processes. They also are conditioned by other factors; for example, the fluctuating power of absorption and the irritability of the sympathetic nervous system. Cutaneous tests are useful in research on the dermatoses of hypersensitization; they are unreliable, however, in the sphere of occupational disease. The tests may be helpful in vocational guidance, since they permit evaluation of the skin's power of resistance and prophylactic defense against certain noxious influences. Thus far, however, the tests have failed to establish the bases of chronic eczema and neurodermatitis. Miescher concluded his lecture with a pointed warning against unduly optimistic and uncritical utilization of cutaneous tests.

Among the numerous briefer papers, mention should be made of the report on malaria therapy of syphilis submitted by Professors Bering and Memmesheimer. These men had studied 1,400 cases of syphilis treated by this method at Cologne. The standard treatment was a minimum of eight induced febrile attacks preceded by administration of bismuth compounds and immediately concluded by administration of arsphenamine. Cases of incipient paralysis offer the most favorable prognosis. With rare exceptions improvement or complete cure was the rule in such cases. Particularly good results were elicited in incipient tabes, especially the type that is inclined to progress rapidly. Constant correspondence was remarked between the values of the cerebrospinal fluid and the clinical observations. In cases of syphilis that presented a positive cerebrospinal fluid reaction but no central nervous manifestations, the treatment nearly always rendered the reaction negative. In no case was tabes or paralysis later observed. In fully developed cases of tabes and paralysis only palliative results were as a rule obtainable.

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Congress of German Gynecologists

The congress of the German Society of Gynecology was concerned chiefly with problems of the management of pregnancy and confinement. Also the care of the new-born infant and the treatment of injuries incurred by the mother during parturition were discussed. Prof. G. A. Wagner of Berlin, chairman of the congress, stressed the need of thorough courses of training for obstetricians and midwives. The congress in a formal petition requested the proper authorities to revise the present sickness insurance so that it would cover all unusual complications of pregnancy, miscarriages, premature births, antepartum and postpartum incidents and so on. The gynecologists would like to have all complicated pregnancies and confinements underwritten by the sickness insurance clubs, even to costs of hospitalization.

The first main report was read by Professor von Jaschke of Giessen on "Heart Disease and Gestation." In his opinion the pessimistic attitude toward the gravida affected with heart disease is unwarranted. Cardiac decompensation alone is not an indication for interruption of pregnancy. Decompensation manifested early in pregnancy by a patient with chronic heart disease should be considered an extremely unfavorable sign only if the woman is kyphoscoliotic.

Other papers dealt with the operative treatment of prolapsed female genitalia and with the care of the new-born infant.

Hospital and Home Confinements

The question of hospital confinements and home confinements has been much discussed in Germany of recent years. The National Bureau of Statistics has just released new data on the subject. Whereas previously statistical reports were based on a limited number of special obstetric institutions and services, the new (1935) figures are based on the records of confinements in all institutions for the sick in Germany. The distribution of the obstetric cases admitted to these institutions is shown in the accompanying table.

Distribution of Obstetric Cases in Institutions

	Total Obstetric Cases Admitted to Institutions	Cases Hospitalized in Special Institutions	Percentage Admitted to Special Institutions
Confinements	321,310	248,638	77.4
Interrupted pregnancies	4,151	1,905	45.9
Miscarriages	87,182	33,422	38.3

According to these figures the total number of miscarriage cases is considerably greater than would have been suspected on the basis of the less comprehensive reports of previous years. In 1935 the number of births (including stillbirths) in all German institutions for the sick was 325,875 (251.2 per thousand births). This means that in 1935 every fourth newborn baby was delivered in an obstetric or other institution. The proportion of institutional confinements to the total number of births exhibits marked regional differences within the reich. In the larger cities many confinement cases are hospitalized in the absence of any particular need or prophylactic purpose. On the other hand it still happens, especially in the poorer rural districts, that the hospitalization of an urgent case will for one reason or another be delayed.

Radium Therapy of Carcinoma of Larynx

The usual therapeutic approaches to cancer of the larynx have been surgery and roentgen irradiation. Another procedure, the application of radium in conjunction with laryngeal fenestration, is worthy of special study both on account of its relative technical simplicity and because the results have thus far been favorable, especially with regard to restoration of laryngeal function. Prof. A. Hermann of Erfurt recently discussed this procedure. Favorable outcome, he says, is predicated on careful selection of suitable cases. Only unilateral circumscribed carcinomas that have not metastasized to any glands are suitable for this type of therapy. The technic of procedure is as follows: After unilateral removal of the ala of the thyroid cartilage, a flat radium container is brought as near as possible to the affected side of the larynx and kept there for several days. The author recommends the use of small quantities of radium and an irradiation time of from 1,300 to 1,400 mg. hours. Larger doses sometimes result in damage to the cartilage; smaller doses have been proved inadequate and are followed by recidivation. To avoid any complication of wound healing, such as secondary infection or cartilaginous necrosis, it is recommended that the ala of the thyroid cartilage of the diseased side be as completely obliterated as possible and careful and constant asepsis maintained. In case the irradiation with radium is followed by recidivation, radical surgical intervention may still be attempted.

Treatment of Diphtheria Bacillus Carriers

Heretofore, attempts to render temporary carriers and constant eliminators of the diphtheria bacillus negative for the organism have been directed against the bacillus itself. Prof. Werner Catel, Leipzig ordinarius in pediatrics, has devised a new procedure. He sought to effect an increase in the defense mechanisms of the mucosa by administration of vitamin A, which substance is reputed to possess epithelium-protective properties. To this end ten drops of a vitamin A preparation (Vogan) were administered orally thrice daily and one drop in each nostril also thrice daily. This medication was maintained for ten days. To be considered successful this therapy must result in a rapid disappearance of the bacilli of diphtheria from the mucosa and the erstwhile carrier must remain permanently free from the organism. Catel's end results were as follows: Of thirty-four temporary carriers and constant eliminators of the bacillus, twenty-nine (85 per cent) became negative within ten days, many within the first few days. Of the five persons still showing positive cultures after ten days' treatment, four became negative on discontinuation of the preparation. In follow-up observation by means of repeated studies of smears, most of which were carried on over several weeks, twenty-one persons remained negative; in seven others an occasional smear was positive for the bacillus. After a greater period the smear studies in these cases, too, became negative.

Finally, one of the six persons who remained positive for the bacillus was rendered free from it by a repetition of the treatment. In fine, 65 per cent of temporary carriers and constant eliminators were permanently rid of the organism after the initial treatment, and if one adds to this number the seven cases in which temporarily a positive smear was observed after the initial treatment, the percentage of cure is 82. Only those persons were selected for the experiment who were known to have carried the bacillus of diphtheria for at least two weeks, in fact, in some instances for several months.

Prof. Erich Lexer Is Dead

Prof. Dr. Erich Lexer, for many years ordinarius in surgery at the University of Munich, died December 4, aged 70. Lexer studied for many years under Ernst von Bergmann in Berlin and in 1904 was appointed director of the surgical clinic of the university in that city. Shortly afterward he was called to Koenigsberg as ordinarius and subsequently he served in the same capacity at Jena and at Freiburg. In 1928 he was appointed to succeed Sauerbruch at Munich. Though Lexer rendered distinguished services to all provinces of surgery, his principal field of specialization was plastic surgery: the correction of deformities of the facies, joints and soft parts. To Lexer we owe, among other things, the valuable procedure of esophagojejunogastrostomosis, which has gained recognition in the United States. In addition to works on plastic surgery, Lexer's "General Surgery" is well known, having already passed through twenty editions and been translated into English.

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Prof. Werner Körte Is Dead

Prof. Werner Körte, a highly esteemed surgeon, well known both in Germany and abroad as permanent secretary of the German Society of Surgery, died December 3, aged 87. His work on the surgery of the pancreas and the biliary ducts has received general recognition.

ITALY

(From Our Regular Correspondent)

Dec. 15, 1937.

Society Reunion

The Società di Anatomia recently held, at Perugia, its seventh national reunion under the chairmanship of Professor Dorello. Professor Castaldi was the speaker for the first official topic, which was "The Extrapyramidal System." He reviewed the development of the knowledge of the system and spoke on the anatomy and functions of the complicated system of nervous routes which, besides the voluntary pyramidal route, carries stimulation for the tonus and automatic movements to the peripheral organs. In the discussion, Professor Donaggio emphasized the importance of the frontal cortex in the complex of the extrapyramidal system, which theory stands in opposition to that of a prevailing importance of the corpus striatum. Professor Benari spoke on the functions of the extrapyramidal system. Professor Bertolini spoke on genetics and morphogenesis of the extrapyramidal system.

Congress of Pediatrics

The fourth International Congress of Pediatrics took place recently in Rome. It was organized by a committee of which the president was Professor Spolverini. Professors Jundell of Sweden, Glauzmann of Switzerland and Allen of the United States spoke on the first official topic, which was "Neuropsychic Diseases in Pediatrics." Professor Jundell emphasized the importance of the prevention in children of preschool age, since psychopathic conditions establish themselves at that age. The ideal place for those children is with the family rather than in institutions. It is advisable that old experienced physicians give lectures to the parents of these children on the management and education of the patients.

Professor Glauzmann said that these children have to learn social behavior and obedience even if punishment is necessary. The methods should be rational, as the wrong attitude toward the patient may affect his personality and psychic development. It is advisable to determine the psychic and somatic character of each patient in order to cope with each individual personality.

Professor Allen pointed out that, in protecting children from neuropsychic diseases, parents have to be advised on the education of their children, special attention being given to the development of a capacity for adaptation. Professor Siegl of Austria, who was the cospeaker, pointed out satisfactory results of suggestion and faradization in the treatment of neuropsychic diseases in children.

The second official topic was "Metabolism of Water and Minerals in Infants." Professor McQuarrie of the United States showed the importance of the maintenance of the equilibrium of water and of certain electrolytes in the body fluids of infants. One can imagine water in the cells as if it were in two different compartments separated from each other by means of a semipermeable membrane. Intracellular and extracellular water comprise 70 and 30 per cent respectively of the total amount of organic water. Potassium predominates in the constitution of the former, whereas sodium and chlorides predominate in that of the latter. Normally, entrance of sodium to the cells and exit of potassium from them are prevented by the cellular membrane. The walls of the capillaries are permeable to organic ions and crystalloids and impermeable to plasmatic colloids; that is, proteins and lipoids. The interstitial fluid is the ultrafiltrate of blood plasma. It is the regulating agent for equilibrium between the relative constancy of the blood and of the intracellular fluids. The integrity of the semipermeable membranes has great chemical and physiologic importance. The equilibrium between liquids which are separated by membranes is ruled by Gibbs and Donnan's formula with the passage of water from lower to higher osmotic pressure. In vomiting, diarrhea and profuse perspiration, the loss of water affects first the interstitial fluids, then the blood plasma and at last the intracellular water. In diarrhea there is a loss of fixed bases with a tendency to the development of acidosis. The opposite loss takes place in vomiting. Administration of dextrose solutions prevents the development of ketosis. It is necessary to administer chlorides and some other fixed bases to infants who vomit.

Professor Csapò of Hungary said that, as children grow, the amount of intracellular water in the body increases whereas that of extracellular water diminishes. The equilibrium of water and salts in the body is disturbed in the course of diseases in infants. There may be retention of water without retention of salts or vice versa. There is a greater loss of chlorides than of sodium from vomiting. The opposite happens in diarrhea.

The third official topic was "Tuberculosis in Children." Professors Dufourt of France, Cohen of Belgium and Faltis of Greece were the speakers. Professor Dufourt spoke on the importance of ultravirus in congenital and acquired tuberculosis in infants. According to the speaker, tuberculosis is not caused by ultravirus in the three stages of tuberculosis. The ultravirus is of some significance in certain forms of curable meningitis which develop in the secondary stage of tuberculosis as well as in the attenuated forms of tuberculosis. The speaker, with Arloing's collaboration, observed the passage of tuberculous ultravirus from mother to child through the placenta. He believes, however, that ultravirus does not persist long in the child's body and does not transform into tubercle bacilli. Professor Cohen said that there are no proofs which support the theories that the filtrable elements of the tuberculous virus are normal infravisible phases of the virus and that they have pathogenic properties and different characteristics from tubercle bacilli. Professor Valtis spoke on the comparative results of intradermal reactions to tuberculin and filtrates. Patients in whom a filtrable virus could be identified reacted to filtrates but not to tuberculin in the majority of the cases. The speaker believes that the results show a probable pathogenic specific importance of a filtrable virus in tuberculosis.

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Marriages

CHARLES T. CHAMBERLAIN, Fort Smith, Ark., to Miss Frances Goodlett of Nashville, Tenn., at Memphis, Tenn., January 1.

DOUGLAS HEWITT FRYER, Eutaw, Ala., to Miss Effie Irene Purdy of Toronto, Ont., Canada, in Montgomery, Ala., Nov. 3, 1937.

HENRY DAVIS CHIPPS, Corinth, Miss., to Miss Frances S. de Butts of Asheville, N. C., Nov. 6, 1937.

ROBERT PITNER LAYMAN to Miss Iris Madge Bailey, both of Knoxville, Tenn., Nov. 15, 1937.

LEON H. FELDMAN, Baltimore, to Miss Ruth Johnston of Philipsburg, Pa., Oct. 17, 1937.

JOHN HOWARD HINES to Mrs. Charlotte McCrea Floyd, both of Atlanta, Ga., Nov. 10, 1937.

JOSEPH I. BUTLER, Brooklyn, to Miss Margaret F. Kiley of Peabody, Mass., Nov. 6, 1937.

GEORGIANA J. VON LANGERMANN, New Orleans, to Mr. W. J. Miles Jr., Oct. 16, 1937.

MILTON B. JACOBSON to Miss Dorothy Mae Kushin, both of Philadelphia, recently.

JACK LARCHE RAWLS to Miss Elizabeth Scott, both of Bastrop, La., recently.

Deaths

Louis Adalore Oliver Goddu ✠ Boston; Tufts College Medical School, Boston, 1905; assistant professor of orthopedic surgery at his alma mater; member of the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; on the staffs of Woonsocket (R. I.) Hospital, Boston Dispensary, New England Medical Center, Beth Israel Hospital, Malden (Mass.) Hospital, Newton (Mass.) Hospital, Whidden Memorial Hospital, Everett, Pondville Hospital, Wrentham, Mass., and Lakeville State Sanatorium, Middleboro, Mass.; aged 58; died, Nov. 11, 1937, at his home in Brookline, Mass.

Rufus Thomas Dorsey ✠ Atlanta, Ga.; Southern Medical College, Atlanta, 1897; Jefferson Medical College of Philadelphia, 1898; past president of the Fulton County Medical Society; veteran of the Spanish-American and World wars; at one time professor of clinical medicine, Emory University School of Medicine, and professor of clinical medicine and physical diagnosis at the Atlanta School of Medicine; formerly on the staffs of the Grady Hospital, Wesley Memorial Hospital and George Baptist Hospital; aged 64; died, Nov. 9, 1937, of coronary thrombosis.

Charles Eastmond ✠ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1904; member of the American Roentgen Ray Society and the American College of Radiology; fellow of the American College of Physicians; served during the World War; aged 58; on the staffs of the Norwegian Hospital, Harbor Hospital, Jamaica (N. Y.) Hospital, Nassau Hospital, Mineola, N. Y., Jewish Hospital, Long Island College Hospital, Beth Moses Hospital and the Peck Memorial Hospital, where he died, Nov. 27, 1937, of carcinoma of the bladder.

Henry Jasper Hartz, Detroit; Detroit College of Medicine, 1889; member of the Michigan State Medical Society; formerly associate clinical professor of medicine at his alma mater; member of the American Laryngological, Rhinological and Otological Society; past president and secretary-treasurer of the board of trustees of the Michigan State Sanatorium, Howell; formerly treasurer of the Michigan Tuberculosis Association; attending physician to the Detroit Tuberculosis Sanatorium, 1911-1915; aged 75; died, Nov. 26, 1937.

William Joseph Lynn, Mexico, D. F., Mexico; University Medical College of Kansas City, Mo., 1904; for many years served with the Canal Zone Commission in Panama; in Costa Rica was in charge of the United Fruit Company Hospital; served in the U. S. Army as sanitary officer in the medical corps until 1919, when he was discharged as a major; aged 55; died, Nov. 12, 1937, of cerebral hemorrhage.

Orville Logan Edwards, Roodhouse, Ill.; Rush Medical College, Chicago, 1914; member of the Illinois State Medical Society; served during the World War; formerly member of the city council, and for many years president of the community high school board of education; aged 51; died suddenly, Nov. 23, 1937, of heart disease.

Allen Bryce Jemison, Biloxi, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1909; at one time director of the Jefferson County (Ark.) Health Department, and in charge of the departments of epidemiology, milk control and malaria control of the state department of health; aged 51; died, Oct. 29, 1937.

James Leon Lewis, New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1898; professor of clinical medicine at the Tulane University Graduate School of Medicine; aged 62; on the staff of the Baptist Hospital, where he died, Nov. 17, 1937, following an operation for appendicitis.

Charles Herbert Cogswell, Pasadena, Calif.; Hahnemann Medical College and Hospital, Chicago, 1866; formerly professor emeritus of obstetrics and diseases of women, State University of Iowa College of Homeopathic Medicine, Iowa City; aged 93; died, Nov. 24, 1937, of acute bronchitis and bronchopneumonia.

Aubrey Michael Larsen ✠ Surgeon Lieutenant Commander, U. S. Navy, retired, Los Angeles; College of Physicians and Surgeons, Baltimore, 1913; entered the navy in 1917 and retired in 1933 for incapacity resulting from an incident of the service; aged 48; died, Nov. 5, 1937, of bronchopneumonia and embolism.

Gaylord Lynch Hardesty, Beaver Falls, Pa.; University of Pittsburgh School of Medicine, 1933; member of the Medical Society of the State of Pennsylvania; aged 33; died, Nov. 28, 1937, in the Beaver Valley General Hospital, New Brighton, of a streptococcic blood infection, pleurisy and pneumonia.

Theodore Swift Barnett ✠ Potsdam, N. Y.; University of Michigan Medical School, Ann Arbor, 1918; served during the World War; school physician to the Potsdam State Normal School; aged 44; on the staff of the Potsdam Hospital, where he died, Nov. 30, 1937, of acute pancreatitis.

Adolph Ernst Dreyer, Detroit; Detroit College of Medicine, 1903; member of the Michigan State Medical Society; veteran of the Spanish-American and World wars; aged 64; died, Nov. 2, 1937, in the United States Marine Hospital, of carcinoma of the stomach with metastasis.

William Edward Fehliman, Santa Cruz, Calif.; Rush Medical College, Chicago, 1906; member of the California Medical Association; served during the World War; aged 57; died, Nov. 24, 1937, in the Emanuel Hospital, Portland, Ore., of an injury received in an automobile accident.

John Carey Fear, Waverly, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1877; past president of the Coffey County Medical Society; formerly mayor of Waverly and representative in the state legislature; aged 82; died, Nov. 4, 1937, of pulmonary edema and arteriosclerosis.

J. D. Mahaney, Columbus, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; member of the Medical Association of Georgia; aged 49; on the staff of the Columbus City Hospital, where he died, Nov. 18, 1937, of acute hemorrhagic pancreatitis and gallstones.

Garland B. Couch, Phoenix, Ariz.; Homeopathic Medical College of Missouri, St. Louis, 1908; member of the Arizona State Medical Association and the Associated Anesthetists of the United States and Canada; aged 66; died, Nov. 21, 1937, in Long Beach, Calif.

Gwen Whelpley Crawford ✠ Bartlesville, Okla.; University of Arkansas School of Medicine, Little Rock, 1930; on the staff of the Washington County Memorial Hospital; aged 30; died, Nov. 23, 1937, of an injury received in an automobile accident, near Antlers.

John Michael Doran, Chelsea, Mass.; Baltimore Medical College, 1907; member of the Massachusetts Medical Society; aged 53; president of the staff of the Chelsea Memorial Hospital, where he died, Nov. 13, 1937, of esophageal varix and myocarditis.

Matthew Robert Blake, Winnipeg, Manit., Canada; Trinity Medical College, Toronto, Ont., 1902; M.R.C.S., England, and L.R.C.P., London, 1903; aged 61; died, Nov. 21, 1937, in St. Boniface (Manit.) Hospital, of hemiplegia and arteriosclerosis.

Philip Jenkins Davies ✠ Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1901; served during the World War; for many years medical school inspector; on the staff of the West Side Hospital; aged 68; died, Nov. 9, 1937, of angina pectoris.

James Warren Campbell, St. Louis, Mich.; Victoria University Medical Department, Coburg, Ont., Canada, 1884; formerly member of the board of education, and health officer; aged 85; died, Nov. 27, 1937, of coronary disease.

John M. Mann, Lake Butler, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1910; president of the state board of medical examiners; formerly state senator; aged 61; died, Nov. 7, 1937, of cerebral hemorrhage.

Benjamin Franklin Loring, Union City, Tenn.; Fort Worth (Texas) School of Medicine, Medical Department of Fort Worth University, 1895; University of Nashville Medical Department, 1902; aged 76; died, Oct. 30, 1937.

Capolis L. Blue, Tocsin, Ind.; Fort Wayne College of Medicine, 1898; member of the Indiana State Medical Association; aged 68; was found dead, Nov. 7, 1937, of angina pectoris, following shock due to an automobile accident.

Hertel Lefebvre de Bellefeuille, Montreal, Que., Canada; University of Montreal Faculty of Medicine, 1935; on the staff of St. Jean de Dieu Hospital for the Insane, Gamelin; aged 29; died, Nov. 8, 1937, in the Hopital Ste. Justine.

John Richard Lynas ✠ Lieutenant, U. S. Navy, Long Beach, Calif.; Indiana University School of Medicine, Indianapolis, 1924; entered the navy in 1924; aged 38; died, Nov. 15, 1937, in Shanghai, China, of diphtheria.

Franklin Marion Carter, Newport, Ore.; Willamette University Medical Department, Salem, 1872; formerly physician to the Siletz Indian Reservation and superintendent of Indian schools; aged 88; died, Oct. 16, 1937.

James Richard Earle, Chicago; Rush Medical College, Chicago, 1906; served during the World War; formerly connected with the U. S. Public Health Service, reserve; aged 58; was found dead, Nov. 18, 1937.

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Arsene A. Letourneau, Auburn, Maine; Victoria University Medical Department, Coburg, Ont., Canada, 1887; aged 74; on the staff of St. Mary's Hospital, Lewiston, where he died, Nov. 1, 1937, of heart disease.

Alvan Maurice Fortney, Lawrence, Kan.; University of Kansas School of Medicine, Kansas City, 1908; served during the World War; aged 55; was found dead, Nov. 5, 1937, of a self-inflicted bullet wound.

Joseph Wells Jackson, Barre, Vt.; University of Vermont College of Medicine, Burlington, 1890; veteran of the Spanish-American War; on the staff of the Barre City Hospital; aged 69; died, Nov. 27, 1937.

William Thompson Jones, Laurel, Del.; University of Maryland School of Medicine, Baltimore, 1895; past president of the Delaware State Medical Society; aged 68; died suddenly, Oct. 22, 1937.

James Harvey Lyon, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1878; aged 84; died, Nov. 26, 1937, in Evanston, Ill., of arteriosclerotic heart disease.

Robert Bennett Brigham ✠ Northampton, Mass.; Harvard University Medical School, Boston, 1928; on the staff of the Cooley Dickinson Hospital; aged 35; died, Nov. 26, 1937, of encephalitis.

Bernard McAuley Bradford, Kannapolis, N. C.; North Carolina Medical College, Charlotte, 1913; served during the World War; aged 47; died suddenly, Nov. 19, 1937, of coronary occlusion.

Elmer E. Hulsizer, Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1888; aged 79; died, Nov. 19, 1937, of hemorrhage of the bladder and cirrhosis of the liver.

Arthur James Douglass, Portland, Ore.; Missouri Medical College, St. Louis, 1895; aged 71; died, Nov. 12, 1937, in the Good Samaritan Hospital, of hemorrhage of the gastro-intestinal tract.

Alva W. Carnes, Hutchins, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1883; member of the State Medical Association of Texas; aged 81; died, Oct. 28, 1937.

John Andrew Cooper, Philadelphia; Medico-Chirurgical College of Philadelphia, 1899; aged 63; died, Nov. 25, 1937, in the Germantown Dispensary and Hospital, of bronchopneumonia.

Earle Pope Gregory ✠ Fryeburg, Maine; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909; aged 60; died, Nov. 20, 1937, of coronary thrombosis.

John Arcade Gilmore, Thomasville, Ala.; Louisville (Ky.) Medical College, 1886; member of the Medical Association of the State of Alabama; aged 81; died, Oct. 25, 1937.

James Thomas Farley, Lancaster, Ohio; Ohio Medical University, Columbus, 1897; member of the Ohio State Medical Association; aged 71; died, Nov. 3, 1937, of angina pectoris.

Benjamin Black Wood ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1899; aged 60; died, Oct. 28, 1937, in the Mercy Hospital, of pulmonary embolism.

Thomas R. Turner, Sherman, Texas; College of Physicians and Surgeons, Baltimore, 1881; aged 83; died, Oct. 3, 1937, in the Wilson N. Jones Hospital, of coronary thrombosis.

Justin Clement Williams ✠ Chicago; Northwestern University Medical School, Chicago, 1925; aged 41; died, Oct. 10, 1937, in Oak Park, Ill., of bacterial endocarditis.

Walter Edward Brown, Oklahoma City, Okla. (licensed in Oklahoma under the Act of 1908); aged 68; died, Nov. 30, 1937, of an infection, following acute tonsillitis.

Charles Edwin Houston, Donalds, S. C.; Medical College of the State of South Carolina, Charleston, 1901; aged 59; died, Nov. 1, 1937, in a hospital at Greenwood.

Rodney Dent Book ✠ Corning, Ohio; Kentucky School of Medicine, Louisville, 1892; aged 71; died, Nov. 6, 1937, in the Grant Hospital, Columbus, of pneumonia.

James Lindsay Galbraith ✠ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1890; aged 69; died, Nov. 4, 1937, of lobar pneumonia.

Charles Robert Elliott, New York; Trinity Medical College, Toronto, Ont., Canada, 1901; aged 58; died, Nov. 16, 1937, in Detroit, of coronary thrombosis.

George Byron Maurice, Waterville, Vt.; University of Vermont College of Medicine, Burlington, 1899; aged 64; died, Nov. 30, 1937, of cerebral hemorrhage.

John Richard Moore, San Antonio, Texas; Meharry Medical College, Nashville, Tenn., 1894; aged 67; died, Oct. 11, 1937, of carcinoma of the stomach.

Charles Fremont Dawson, Matthews, Ind.; Curtis Physio-Medical Institute, Indianapolis, 1892; aged 80; died, Nov. 27, 1937, of arteriosclerosis and prostatitis.

Mortimore Silas Reynolds, Yates Center, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; aged 72; died, Oct. 26, 1937, of angina pectoris.

Guy Leland Laraway, Jackson, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; aged 77; died, Oct. 20, 1937.

Charles B. Long, Jonesville, Mich.; Chicago Homeopathic Medical College, 1889; aged 75; died, Nov. 14, 1937, as the result of an automobile accident.

George Freeborn Gavin, Boston; Bellevue Hospital Medical College, New York, 1885; aged 79; died, Nov. 6, 1937, of myocarditis and arteriosclerosis.

Arthur Rose Guerard, Hollis, N. Y.; Bellevue Hospital Medical College, New York, 1895; aged 86; died, Oct. 27, 1937, in Leesburg, Va., of thrombosis.

Thomas Devan Bourdeaux ✠ Meridian, Miss.; Medical College of Alabama, Mobile, 1902; aged 58; died, Nov. 24, 1937, of pneumonia and heart disease.

Alfred H. Churchill, Oswego, Ill.; Northwestern University Medical School, Chicago, 1899; aged 64; died, Nov. 27, 1937, of amyotrophic lateral sclerosis.

Alice E. Twichell, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1896; aged 80; died, Nov. 16, 1937, of carcinoma of the uterus.

Edmund Peter Larkin, Scranton, Pa.; Jefferson Medical College of Philadelphia, 1912; aged 50; died, Oct. 25, 1937, of pulmonary tuberculosis.

Everett T. Skeels, Toledo, Ohio; Eclectic Medical College, Cincinnati, 1912; served during the World War; aged 49; died, Oct. 11, 1937.

John Emmett Hill, Monrovia, Calif.; Jefferson Medical College of Philadelphia, 1897; aged 66; died, Nov. 19, 1937, in Rialto, of endocarditis.

John W. Sublett, Jean, Texas; University of Louisville (Ky.) Medical Department, 1885; aged 76; died, Oct. 2, 1937, of pernicious anemia.

Lille Forrest Chapman, Woodhull, Ill.; Loyola University School of Medicine, Chicago, 1919; aged 45; died, Nov. 16, 1937, of heart disease.

Clarence Merrill Clark ✠ St. George, Utah; Jefferson Medical College of Philadelphia, 1908; aged 62; died, Oct. 29, 1937, in Los Angeles.

Karl Holden Chandler, Cleveland; Cleveland-Pulte Medical College, 1914; served during the World War; aged 46; died, Oct. 17, 1937.

Benjamin D. Caldwell, Lambert, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1880; aged 77; died, Oct. 13, 1937.

Milton Arthur Barton, Plains, Pa.; Louisville (Ky.) Medical College, 1905; aged 59; died, Nov. 4, 1937, of coronary artery thrombosis.

John Edward Dance, Murfreesboro, Tenn.; University of Nashville Medical Department, 1873; aged 89; died, Nov. 25, 1937, of senility.

John Webster Crosswhite, Weston, Texas; Kansas City (Mo.) Medical College, 1892; aged 81; died, Nov. 3, 1937, of arteriosclerosis.

John E. McFarland, Millgrove, Ind. (licensed in Indiana in 1897); aged 89; died, Oct. 13, 1937, of chronic myocarditis and nephritis.

Oscar Sargent, Jacksonville, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1880; aged 81; died, Oct. 24, 1937.

George Williams Clark, Shippenville, Pa.; Eclectic Medical Institute, Cincinnati, 1904; aged 65; died, Nov. 13, 1937, of heart disease.

Thomas E. Thompson, Mount Olivet, Ky.; Cincinnati College of Medicine and Surgery, 1894; aged 71; died, Oct. 11, 1937.

George Frank Allen, Aurora, Ill.; Rush Medical College, Chicago, 1880; aged 82; died, Nov. 7, 1937, of aplastic anemia.

Edwin Miles Wheeler, Baltimore; Baltimore Medical College, 1896; aged 67; died, Oct. 13, 1937, of angina pectoris.

Romeyn B. Hart, Marietta, Ohio; Medical College of Ohio, Cincinnati, 1882; aged 79; died, Oct. 6, 1937.

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Correspondence

FEDERAL SUBSIDY TO SCHOOLS OF AGRICULTURE

To the Editor:—My attention has been called to an editorial comment appearing on page 132 of the January 8 issue of THE JOURNAL. This item refers to and quotes from a statement of one of the Cornell trustees—Mr. Babcock, representing the New York State Grange—with regard to federal pressure on the administration of the state colleges here at Cornell. This statement was an expression of Mr. Babcock's own views. I enclose a letter written by Dean Ladd of the State College of Agriculture to Governor Lehman expressing contrary views, which are clearly, in my opinion, better informed and more fully in accord with the facts. I take it for granted that you will wish to give the same kind of publicity to the statement by Dean Ladd that you have given to that by Mr. Babcock.

EDMUND E. DAY, Ithaca, N. Y.
President, Cornell University.

NOTE:—The statement of Dean Ladd, in part, follows:

Honorable Herbert H. Lehman,
Governor of the State of New York,
Albany, New York.

Dear Governor Lehman:

As the responsible head of the New York State College of Agriculture, I feel that I should inform you, the Chief Executive of the State, of recent statements widely reported in the press in regard to the relationships between the College and the Federal authorities which might lead to serious misunderstanding. I am sending this letter to you after conference with President Day and with his approval.

On December 15 or 16, several papers reported and badly garbled the speech made by Mr. H. E. Babcock, Grange Trustee of Cornell University, before the Annual Meeting of the New York State Grange at Ogdensburg, New York. The statements as printed in the various papers are substantially identical but I quote from the Ithaca *Journal* of December 15.

"H. E. Babcock of Ithaca told the New York State Grange today that the Federal Government was exerting 'constant pressure' upon Cornell University in an effort to have 'more and more to say about the conduct of agricultural research and education' . . .

"He expressed the fear that unless the 'constant pressure' (on Cornell) were checked 'it will lead us into complications and difficulties and I, therefore, have been very alert and shall continue to be alert to keep the management of the University within the State even if necessary at the cost of revenue if it comes from Federal sources.' . . ."

I have immediately brought together the administrative heads of the various lines of work in the College of Agriculture and asked them to review this statement objectively with me in order to determine whether there are any factors in the field of State and Federal relationships that should give us concern.

Our administrative group feel, and I believe that we are unanimous, that the Federal Government has never within our experience attempted in any way to bring pressure to bear upon the research and teaching work of the State College of Agriculture.

Federal funds for aid in agricultural teaching are administered through the United States Department of the Interior and never in the slightest degree has that department attempted to influence the use of these funds except to check them carefully in order to make sure that they were used in compliance with the law.

Research funds provided by the Federal Government for use in the State are used for the support of very definite research projects. These projects are always initiated in the College of Agriculture. *The United States Department of Agriculture either approves or disapproves of the projects proposed by this institution. Since each basic law providing research funds has certain qualifications as to the fields of work that can be supported by that particular fund the Department of Agriculture is obliged to check carefully in order to see that the State College complies with the law in the expenditure of the funds. In this, needless to say, the State College gives full cooperation and the only questions that arise are in regard to interpretation of the basic Acts.* (Italics ours.—EDIT.)

The newspaper accounts also contain the following:

"Babcock asserted his belief that Cornell research and teaching had waned."

I have read Mr. Babcock's original manuscript and it contains no such statement. On the contrary, the original manuscript is highly complimentary to the work of the State College and to the members of the staff.

We believe that the research and teaching work has consistently improved in quality and effectiveness, but if any serious doubts should exist in regard to it, we should be happy to have this question studied by any qualified group of people.

I know of your keen interest and great confidence in the institution and the staff who are attempting to serve the State through this research, teaching, and extension teaching work. I am sure that it is unnecessary to defend the work before you. In view of the fact, however, that these newspaper reports have been widely printed, I feel that in all fairness you should have a statement from this institution giving the facts as we see them.

In order that the facts of the case may be brought as promptly as possible to the attention of those most directly concerned, I am taking the liberty of sending copies of this letter to members of the Cornell Board of Trustees, the Commissioner of Education, the Secretary of Agriculture, the Secretary of the Interior, and to selected members of our own staff.

Very truly yours,

CARL E. LADD, Dean.

THE FUTURE OF PATHOLOGY

To the Editor:—Pathologists will doubtless agree in general with the Dorland dictionary definition of pathology as "that branch of medicine which treats of the essential nature of disease." Many, therefore, were doubtless disturbed, as I was, to read in the editorial comment in THE JOURNAL, January 1, page 50, under the heading given above, most of a column devoted to the activities of the hospital and private laboratory (i. e., largely diagnostic procedures). Granting the correctness of the statements about pathology as applied to hospital and private laboratories, though much of this work may be technically biochemical, bacteriologic or serologic, should it not have indicated that only one phase of pathology was being considered? The future of pathology as a whole will be chiefly affected by its efficiency in maintaining and improving pathologic teaching and investigation and by the ability of all kinds of pathologists to adapt their specialty to the ever changing aspects of medical progress. Such factors as the pathologist's adequate control of hospital laboratory work, the part he takes in organized medicine and even his interest in clinical medicine, desirable and important though these features are, would seem to be of less importance to the future of the discipline.

When Dr. Kracke made his presidential address to the American Society of Clinical Pathologists, it is obvious that his hearers correctly understood his use of the term "pathology" as referring to the type of work that his society was concerned with. As a topic in the editorial comment, however, the "future of pathology," interpreted in this way, presents Dr. Kracke's special and narrower meaning to such a large number of the medical profession that serious misconception of the proper scope of pathology is unavoidable. I ask, then, that you publish this reminder that pathology is a basic branch of medical science which has been defined as dealing with "the causation, development, nature of and disturbances—structural and functional—produced by disease."

E. B. KRUMBHAAR, M.D., Philadelphia.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SULFUR METABOLISM AND ARTHRITIS

To the Editor:—Please estimate the status of cystine determination of the nails and the colloidal sulfur treatment of arthritis. M.D., Cuba.

ANSWER.—Some observers long have held that sulfur and not the heat of sulfur baths benefits rheumatic patients. Hence the use of sulfur waters and sulfur tonics for rheumatism has attained favor on an empirical basis. In 1904 Goldthwaite noted a decrease in the content of sulfur in patients who had atrophic arthritis; also he observed a retention or positive sulfur balance in patients who had hypertrophic arthritis. In 1925 and thereafter Cawadias reported that patients who had arthritis deformans exhibited "a distinct disturbance of sulfur metabolism usually a deficient fixation of sulfur or deficient thiopexy." As a result, patients who had chronic rheumatism were in negative sulfur balance. The content of cystine in certain tissues, such as the fingernails, is regarded by some observers as a reliable indicator of the metabolism of sulfur in the body. The normal concentration of cystine in the nails has been reported as from 10.2 to 13 mg. per hundred cubic centimeters; the average is 11.8 mg. Several investigators have reported that in patients with chronic arthritis the concentration of cystine in the nails was found to be low, from 6.5 to 9.8 mg., the average being 8.2 mg. Others have reported a range from 7.2 to 13 mg., with an average of 9.8 mg.

According to Sullivan and Hess, the body uses compounds of sulfur such as cystine, cysteine and glutathione in processes of detoxification. The nails of arthritic patients contain normal amounts of three basic amino acids, arginine, histidine and lysine, but the normal amount of cystine is reduced. This low concentration of cystine in nails therefore has been interpreted as an indication of the existence of an inadequate mechanism for detoxification in the presence of arthritis. After therapy with sulfur the cystine content of the nails rises in the presence of both atrophic and hypertrophic arthritis. Wheeldon therefore suggested that at least some, if not all, forms of arthritis are made possible by the presence of a deficiency of sulfur particularly in cartilage, which contains chondroitin sulfuric acid. He suggested also that if a patient is given a sufficient reserve of sulfur with which to combat the contributing etiologic factor, arthritis would not occur. He suggested that the presence of a sufficient reserve depends on the ability of the intestinal tract to absorb sulfur in a normal manner.

There has been a revival of sulfur therapy for arthritis since 1934. Various preparations of colloidal sulfur have been given intramuscularly or intravenously for different types of arthritis and rheumatism. Reactions due to the toxicity of sulfur have been rare. Fever, small cutaneous sloughs, fatigue, headache, drowsiness, anorexia, increasingly painful joints and less frequently urticaria, erythema, nausea, vomiting, cramps and diarrhea have occurred. Of patients who had atrophic or hypertrophic arthritis or fibrositis, the condition of from 50 to 85 per cent has been "improved." During the past year there has been a distinct recession of interest in such therapy. However, Forbes and others have recommended a diet high in sulfur and low in carbohydrate. They reported that, in general, patients who have chronic arthritis give evidence of indoluria, which suggested an impairment of the mechanism of detoxification in the liver resulting from a deficiency of sulfur in the body, sulfur being necessary for the detoxification of indole and for its conversion into indican. On such a diet "marked improvement" of a small number of patients who had atrophic or hypertrophic arthritis was noted, and evidence of indoluria disappeared.

Race in 1927 noted an increased excretion of neutral sulfur in the urine of twenty of forty-two patients who had atrophic arthritis and whose sulfur balance was positive. Senturia in 1935 also observed no evidence of abnormal partition of sulfur or abnormal elimination of sulfur in the urine of arthritic patients. According to Race in 1935 the lowered concentration of cystine of nails may be due not to a disturbance of general metabolism of sulfur but to the reduced albumin-globulin ratio in plasma. The concentration of cystine in globulin is lower than that in albumin, and the amount of cystine observed in nails may merely be a reflection of alterations in plasma proteins. Senturia in 1934 observed a normal glutathione content of the blood of patients who had atrophic arthritis, hypertrophic arthritis or periarthritis. Others, including Cecil, Kinsella and Dawson, have noted "disappointing results" from sulfur therapy in arthritis. A neutral observer would conclude that the rationale of such therapy is by no means established and that the results of therapy by the new colloidal preparations of sulfur are no better than those from a large number of other helpful but not curative procedures for arthritis. The Council on Pharmacy and Chemistry has repeatedly refused to accept "colloidal sulfur" preparations because of lack of sound evidence of their claimed usefulness.

The following articles describe recent work on the subject:

Argy, W. P.: Arthritis: Treatment with Sulfur by Intravenous and Intramuscular Injection, *J. Bone & Joint Surg.* **16:** 909 (Oct.) 1934; Arthritis: Comparison of Cystine Content of Fingernails with Sedimentation Reaction of Blood, THE JOURNAL, Feb. 23, 1935, p. 631.

Cecil, R. L.: Medical Treatment of Chronic Arthritis, *ibid.*, Nov. 24, 1934, p. 1583.

Dawson, M. H.: Chronic Arthritis, in Nelson's Loose-Leaf Medicine, New York, Thomas Nelson & Sons **5:** 605, 1935.

Forbes, J. C.; Neale, R. C.; Hite, O. L.; Armstead, D. B., and Rucker, S. L.: Studies on Effect of High-Sulfur Low-Carbohydrate Diet in Chronic Arthritis, *J. Lab. & Clin. Med.* **21:** 1036 (July) 1936.

Kinsella, R. A.: Medical Aspects of Chronic Arthritis, *Radiology* **24:** 413 (April) 1935.

Krestin, David: Treatment of Chronic Nonspecific Arthritis with Intramuscular Injections of Sulfur, *Brit. M. J.* **2:** 1144 (Dec. 14) 1935.

Race, Joseph: Biochemical Investigations in Chronic Rheumatic Diseases, in Reports on Chronic Rheumatic Diseases, London, H. K. Lewis & Co., Ltd. **1:** 55, 1935.

Rawls, W. B.; Gruskin, B. J., and Ressa, A. A.: The Value of Colloidal Sulfur in the Treatment of Chronic Arthritis, *Am. J. M. Sc.* **190:** 400 (Sept.) 1935.

Senturia, B. D.: Glutathione Content of Blood in Chronic Arthritis and Rheumatoid Conditions, *J. Lab. & Clin. Med.* **19:** 1151 (Aug.) 1934; Results of Treatment of Chronic Arthritis and Rheumatoid Conditions with Colloidal Sulfur, *J. Bone & Joint Surg.* **18:** 119 (Jan.) 1934; Urinary Sulfur in Chronic Nonspecific Arthritis, *J. Lab. & Clin. Med.* **20:** 855 (May) 1935.

Sashin, David, and Spanboch, Joseph: Intravenous Injection of Colloidal Sulfur in the Treatment of Rheumatoid and Osteo-Arthritis, *M. Rec.* **142:** 332 (Oct. 2) 1935.

Sullivan, M. X.: Sulfur and Cystine in Relation to Arthritis, *M. Ann. District of Columbia* **3:** 233 (Sept.) 1934.

Sullivan, M. X., and Hess, W. C.: Cystine Content of Fingernails, in Arthritis, *J. Bone & Joint Surg.* **16:** 185 (Jan.) 1934.

Wheeldon, T.: Use of Colloidal Sulfur in Treatment of Arthritis, *ibid.*, **17:** 693 (July) 1935.

Woldenberg, S. C.: Sulfur (Colloidal) Therapy in the Treatment of Arthritis, with Report of 100 Cases, *M. Rec.* **139:** 161 (Feb. 21) 1934; Sulfur (Colloidal) Therapy in Treatment of Arthritis, *M. Bull. Vet. Admin.* **12:** 10 (July) 1935; Treatment of Arthritis with Colloidal Sulfur: Report of 250 Cases, *South. M. J.* **28:** 875 (Oct.) 1935.

PILOCARPINE IN ALOPECIA

To the Editor:—Is pilocarpine nitrate as recommended for alopecia given by mouth? Which is more effective, pilocarpine nitrate or pilocarpine hydrochloride? Over how long a period should these drugs be administered before a result may be expected? What is the danger of toxicity and undesirable side actions? M.D., New York.

ANSWER.—Pilocarpine in the treatment of alopecia is applied in a lotion. Either the nitrate or the hydrochloride is effective, the only difference between them being the solubility. This would make no difference in the usual lotion, which contains only 0.5 per cent of the drug. No prognosis can be given without a statement of the kind of alopecia to be treated. Toxic alopecia, the partial baldness that follows fevers, pregnancy or other toxic conditions, responds in most cases promptly, in a few months, Alopecia areata is difficult to prognosticate, one case clearing up in a few months, another apparently similar case refusing to improve even after years of energetic treatment. Seborrheic alopecia can usually be brought to a cessation of hair loss in a few months. Congenital alopecia and senile baldness are usually resistant to treatment.

Pilocarpine stimulates the parasympathetic nervous mechanism. In toxic doses it causes miosis and spasm of accommodation, disturbing vision, causes intense sweating, vomiting, diarrhea, cardiac weakness, dyspnea, great increase of bronchial secretion, leading to edema of the lungs, uterine tetanus, abortion, and sometimes sudden collapse. It is contraindicated in pregnancy and asthma and in patients who tend to edema of the lungs. The drug is difficult to use because its action varies in different patients because of the fact that their parasympathetic-sympathetic balance is disturbed at different points. One patient sweats promptly and severely, the next one refuses to sweat at all but may react in some other way. On the skin its toxic action has been recorded as resulting in an itching eruption, which may be macular, papular or wheal-like. This occurs rarely.

Among its other effects, it stimulates the sweat and sebaceous glands and has a reputation among dermatologists as a stimu-

lant of hair growth. Jackson and McMurtry (Treatise on Diseases of the Hair, Philadelphia and New York, Lea & Febiger, 1912, p. 94) state that "a host of medicinal agents have been recommended for stimulation of the hair. The only one that seems to exert a specific action is pilocarpine." Not only does it stimulate, in rare instances it causes the hair to become dark. This has been noted both from internal use of the drug and following its use in a lotion. The latter acts in all probability by allowing absorption of the drug through the skin. This view is supported by the case cited by Milko (Ein Fall chronischer Pilocarpinvergiftung, *Klin. Wchnschr.* **9**:170 [Jan. 25] 1930). A man, aged 43, complained of attacks of a feeling of oppression in the chest succeeded by momentary loss of consciousness. These attacks came on when he exerted himself, as by walking up stairs or lifting heavy objects. At other times he had unpleasant sensations in the cardiac region and became easily tired, very nervous and mentally depressed. He at one time had diarrhea for two weeks, not controlled by diet or home remedies and in three months he had lost 17½ pounds (8 Kg.). On examination nothing abnormal was found except lassitude, a slow pulse, and the action of the pupils, which although reacting promptly to light and in accommodation did not dilate fully. The patient stated that he did not use sedatives but finally mentioned a scalp lotion containing 0.5 per cent pilocarpine, which he had used daily for several months, about a month longer than the illness. When this was discontinued he promptly recovered and in three weeks gained 13 pounds (6 Kg.). This seems to be the only case of pilocarpine poisoning from the use of a lotion, although it has been used in this way by thousands. Milko recommends that its use for the treatment of alopecia be discontinued; but whether this is necessary or not, the case is a warning that one should always forbid refilling prescriptions for such lotions and insist that the patient see the doctor frequently during their use.

CAROTID SINUS SYNDROME

To the Editor:—A man, aged 56, is suffering from a carotid sinus syndrome. The blood pressure varies between 145/90 and 170/110. Digital pressure causes unconsciousness. One of the consultants suggested denervation of the sinus. Kindly give the indications for and prognosis of operations in such cases. The patient is highly neurotic, but excepting for the spells of dizziness his condition does not interfere with a normal conduct of life. What is the mortality in case of surgical intervention? Please refer me to literature.

M.D., New York.

ANSWER.—In order to use rational therapy, it is first necessary to determine the type of carotid sinus reflex which is hypersensitive. Attacks of syncope may be due to one or a combination of three separate mechanisms: (1) a vagal reflex resulting in slowing of the heart, (2) a vasomotor reflex resulting in a fall in blood pressure independent of the heart, and (3) a cerebral reflex which may cause syncope and convulsions without significant alterations in blood pressure or pulse rate. The first and the last are the most common. Differentiation is readily accomplished by giving the patient 0.001 Gm. (one-sixtieth grain) of atropine sulfate intramuscularly and when the atropinization is maximal, usually in from forty-five to sixty minutes, the carotid sinus is stimulated by pressure and the effect observed. If syncope is abolished, the symptoms are due to the vagal reflex. If syncope occurs as before, in spite of the absence of significant cardiac slowing or drop in blood pressure (type 2) the cerebral reflex is hypersensitive.

Therapy of the irritable vagal reflex is easily accomplished by daily doses of belladonna. If enough is given to dry the mouth slightly but not uncomfortably, the attacks are usually relieved. Operation is not indicated in this group. In the cerebral type of sensitivity no specific therapy is available. Operation is not to be advised unless all other forms of treatment fail and the patient is incapacitated. General measures to reduce nervousness, fatigue and worry sometimes are useful. Tobacco, alcohol and coffee should be prohibited to determine whether they are responsible. Vitamin B concentrates should be given. Surgical denervation has been performed in a number of cases without any deaths. In properly selected cases it is usually successful, but especially in older persons it carries definite dangers, owing to the temporary hypertension and tachycardia that result.

Finally, it should be pointed out that the presence of a hypersensitive carotid sinus in a patient with dizzy spells does not necessarily prove that the former is the cause. The induced attacks must be identical with the spontaneous ones.

References:

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Weiss, Soma; Capps, R. B.; Ferris, E. B., Jr., and Munro, Donald: Syncope and Convulsions Due to a Hyperactive Carotid Sinus Reflex, *Arch. Int. Med.* **58**: 407 (Sept.) 1936.

VITAMIN D MILK

To the Editor:—1. How much irradiated milk is equivalent in vitamin D content to a teaspoonful of cod liver oil? 2. In the vitamin D milk "Vitex" how much vitamin D is added and what is its content compared with irradiated milk?

M.D., Connecticut.

ANSWER.—1. Most of the irradiated milks that have been accepted by the Council on Foods contain 135 U. S. P. units of vitamin D per quart. There are some dairies, however, which market irradiated milk containing 200 U. S. P. units of vitamin D per quart. Cod liver oil, U. S. P., contains a minimum of 315 U. S. P. units of vitamin D per teaspoonful.

2. "Vitex" concentrate is added directly to the milk prior to the pasteurization. The fluid milks fortified by this concentrate which have been accepted by the American Medical Association Council on Foods contain 400 U. S. P. units of vitamin D per quart. The Council on Foods published a report on the present status of vitamin D milk in THE JOURNAL, Jan. 16, 1937, page 206, which should be consulted. Since publication of this decision the Council has accepted vitamin D milk produced by feeding irradiated yeast to cows and containing a minimum of 400 U. S. P. units of vitamin D per quart sold under the name of Metabolized Milk, and milk fortified by the addition of irradiated ergosterol and containing 400 U. S. P. units of vitamin D per quart.

TREATMENT OF ACNE ROSACEA

To the Editor:—1. What is the best treatment for acne rosacea? The patient is in her late thirties. 2. Is an autogenous vaccine of value?

M.D., North Carolina.

ANSWER.—Three objectives in the treatment of acne rosacea are (1) abolition of the reflex which dilates and finally paralyzes the blood vessels of the flush areas of the face, (2) removal of local irritation and (3) removal of the results of chronic disease.

1. Too rapid eating or overeating should be forbidden and many articles of diet must be eliminated. Hot foods and hot drinks, coffee, tea, alcohol, condiments, rich gravies and heavy desserts, are not allowed. Tobacco is also forbidden. Anything that may arouse a reflex from the stomach is to be avoided. Plenty of water must be taken. If a gastric analysis reveals a deficiency of hydrochloric acid in the stomach the dilute acid should be given, about 1.3 cc. (20 drops) with or after each meal, sipped through a glass tube. If acid is hyperabundant in the stomach, alkalis may be given and the meals made small and frequent. Focal infection, particularly in the nose or mouth, must be found and eliminated. After removal, autogenous vaccine may be of benefit. Pelvic disease, if present, should be treated. If there are indications of an early menopause, appropriate treatment should be given, bromides being avoided for fear of increasing gastric irritation and encouraging pus formation, which bromides frequently do. Symptoms indicative of hyperthyroidism or other endocrine disturbance should not be overlooked. Nervousness from other causes, often emotional, should be treated by calm discussion and advice. Hachenburg found high blood pressure in more than half the cases that he investigated (Hachenburg, D.: Research on the Basic Factor of Acne Rosacea, *Dermat. Wchnschr.* **92**:165 [Jan. 31], 197 [Feb. 7] 1931).

2. Amelioration of the flushing and eruption can be obtained by the local application each night, after washing the face with soap and tepid or cold water, of a sulfur preparation, lotio alba. The most useful one is made of sulfurated potash and zinc sulfate, 1 Gm. (15 grains) of each, in 30 cc. (1 fluidounce) of rose water. If this causes too much drying and scaling, 3 cc. (45 drops) of glycerin may be added; but the best results are obtained when the skin is kept quite dry. Cold cream, hot water and massage by the beauty specialist should be avoided. The lotion should be prescribed in small amounts and frequently renewed, for it soon loses its strength. Some patients with rosacea have an irritable skin and it may be necessary to begin with half strength lotion.

Ultraviolet radiation in doses capable of causing a mild erythema is beneficial, even more so, in the pustular cases, than x-rays, according to Andrews. (Andrews, G. C.: Diseases of the Skin, Philadelphia, W. B. Saunders Company, 1930, p. 511). The patient should be treated twice a week.

Treatment with roentgen rays in divided doses, one-eighth unit (37 roentgens) or one-fourth skin unit (75 roentgens) once a week until the skin clears, is valuable. It should be discontinued if a dose of three full units has been given without success. There is some danger of damaging the skin.

If a scaly blepharitis is present the aid of an ophthalmologist should be enlisted.

The contents of the pustules should be examined for Demodex folliculorum, and if this is found abundantly present, the strong

sulfur treatment as advocated by Samuel Ayres Jr. and N. P. Anderson may be tried (THE JOURNAL, March 4, 1933, p. 645). They advise the application, after washing the face with soap and water, of the Danish ointment for scabies. This is allowed to remain on the face all night and is removed in the morning with cold cream. This procedure is repeated on the following two nights. If the course of three applications does not suffice to clear the eruption, the ointment may be applied once or twice a week thereafter. Of forty-seven cases treated in this way, they report that forty-five showed good results.

The removal of the after-effects of rosacea is attained by the destruction of the telangiectatic vessels. This is done by electrolysis, the needle attached to the negative pole being inserted into the vessel and a current of from 1 to 1.5 milliamperes being allowed to flow for a few minutes, until the vessel turns white. The needle is then removed while the current is still flowing, to prevent bleeding. If the first application is not sufficient, the treatment may be repeated after the small punctures heal. The other lasting blemish resulting from rosacea, rhinophyma, enlargement of the end of the nose, seldom occurs in women.

HELIUM-OXYGEN MIXTURES

To the Editor:—I have read in newspapers of the use of helium gas as mixed with air in treatment of diseases of the lungs but am unable to locate scientific articles on this subject. Has it been studied in anaerobic and aerobic states of bacterial cultures and if so are reports in print? Are there articles describing reactions when it may be injected into the tissues?

S. F. HOGE, M.D., Little Rock, Ark.

ANSWER.—The therapeutic use of helium in asthma and obstructive lesions of the trachea and larynx depends wholly on its decreased specific gravity in relation to nitrogen. Since the weight of a comparable volume of nitrogen is seven times greater than that of helium, a mixture of 21 per cent oxygen and 79 per cent helium may be substituted for 21 per cent oxygen and 79 per cent nitrogen (air) thus providing a respirable gas mixture which has one third the density of air. The velocity of movement of a gas through small orifices is proportional to the square root of the density of the gas; the helium-oxygen mixture would require, therefore, almost half the pressure required for air for its passage through constricted orifices (Barach, A. L.: The Therapeutic Use of Helium, THE JOURNAL, Oct. 17, 1936, p. 1273; other references are given in this article). Sayers and Yant showed that animals could be decompressed from ten atmospheres of helium-oxygen mixture in one third the time necessary for a nitrogen-oxygen mixture (Sayers, R. R., and Yant, W. P.: Value of Helium-Oxygen Atmosphere in Diving and Caisson Operations, *Anesth. & Analg.* **5**:127 [June] 1926). Rabbits have lived in mixtures of 79 per cent helium and 21 per cent oxygen for two months without harmful effect and it has also been shown that helium, as well as the other rare gases, may be removed from the atmosphere without evident changes in animal life (Barach, A. L.: Rare Gases Not Essential to Life, *Science* **80**:593 [Dec.] 1934). The root growth of the sweet pea takes place in atmospheres as low as 1.5 per cent of oxygen when the diluent is nitrogen, but, if the diluent is helium, growth will proceed in a concentration as low as 0.5 per cent of oxygen owing to oxygen diffusing more quickly through helium than through nitrogen (Cannon and Free: *Carnegie Inst. Washington Year Book* **19**:59, 1920). No articles have been published concerning the effect of the subcutaneous injection of helium.

ACETYLSALICYLIC ACID, ACETOPHENETIDIN AND SODIUM SALICYLATE

To the Editor:—What is the relative rate of absorption, excretion and toxicity of acetylsalicylic acid (aspirin), acetophenetidin (phenacetin) and sodium salicylate? Is there any way of avoiding a yellow coloration of the urine when these substances are excreted? What may be considered safe doses of these substances when administered for a long time in cases such as irritable spine due to strain caused by an automobile accident? Is there any other safe drug, more efficacious than those just mentioned, which can be given instead?

E. W. HOUGHTON, M.D., Detroit.

ANSWER.—Sodium salicylate administered by mouth appears in the urine in from fifteen to eighteen minutes. With doses of from 1 to 2 Gm. the excretion is completed in twenty-four hours; with doses of from 4 to 5 Gm., in forty-four hours. Acetylsalicylic acid is more slowly absorbed, because it must pass through the stomach before it can undergo absorption in the intestine. It is also more slowly eliminated, requiring an average of five days for elimination after full therapeutic dosage. Acetophenetidin is rather rapidly absorbed. The full therapeutic action is obtained within two hours and usually does not last longer than eight hours. The average U. S. P. dose of acetophenetidin is given at 0.3 Gm. and twice that quantity may generally be considered safe. The average dose of acetylsalicylic acid is stated at 0.3 Gm.; but three times that dose may safely be given to any excepting an allergic adult. The average U. S. P. dose of 1 Gm. for sodium salicylate had better not be exceeded, for more given at one time is not likely to be retained by the stomach. Of all the analgesics, acetylsalicylic acid is probably the safest and most efficient, provided there is no idiosyncrasy. Its analgesic action may be increased by adding a barbiturate, such as phenobarbital (e. g., in one tenth the dose of the acetylsalicylic acid) to each dose.

AUTOINTOXICATION

To the Editor:—Please give me the present status of opinion on autointoxication. What chemical compounds, if any, are believed to cause the symptoms?

W. A. FOWLER, M.D., Norman, Okla.

ANSWER.—This subject was reviewed extensively by W. C. Alvarez (Intestinal Autointoxication, *Physiol. Rev.* **4**:352 [July] 1924), who pointed out that what was commonly assumed to be a chemical intoxication could not usually be such, since relief of the alleged toxic symptoms occurred immediately after emptying of the bowel. It was considered therefore that the source of irritation must be mechanical rather than toxic. Up until that time also no chemical had been implicated as the cause of autointoxication, since it was not possible to show that the substance in question could get through the intestinal mucosa and pass the capillaries of the liver and lung unchanged. Definitely less interest in the subject has existed in recent years, but observations have been reported by Hines, Lueth and Ivy (*Arch. Int. Med.* **44**:147 [July] 1929), Pearcy and Van Liere (*Tr. Am. Gastro. A.*, 1925, p. 135) and Pearcy and Allen (*Am. J. Physiol.* **82**:56 [Sept.] 1927).

Histamine has been thought to be one of the substances possibly causing autointoxication, but Weiss, Ellis and Robb (*Am. J. Physiol.* **90**:551 [Oct.] 1929) injected histamine steadily into the blood stream and found that it was destroyed almost as rapidly as it entered. Wangensteen and Loucks (*Arch. Surg.* **16**:1089 [May] 1928, abstr. THE JOURNAL, June 30, 1928, p. 2138), also concluded that the amount of histamine absorbed even from the strangulated loops of the intestine was small. Further studies on this subject have been reported by Koessler and Hanke (*J. Biol. Chem.* **59**:803 [April] 1924), Swingle and Nicholas (*Am. J. Physiol.* **69**:464 [Aug.] 1924) Biebl (*Deutsche Ztschr. f. Chir.* **218**:135, 1929) and Power and Sherwin (*Arch. Int. Med.* **39**:60 [Jan.] 1927).

It has been demonstrated that cathartics increase the permeability of the intestine for toxic substances. Schwartz (*Arch. Dermat. & Syph.* **13**:672 [May] 1926) concluded that internal toxemia is an important factor in many dermatoses. The demonstration of the effects of such toxins in the blood stream, however, is not evidence of their passage from the intestine into the blood stream, since many protective factors exist. A good review of the possibilities of bacterial toxins passing into the blood has been published by Zinsser (*J. Immunol.* **5**:266 [May] 1920).

CARCINOGENIC PROPERTIES OF VARIOUS OILS

To the Editor:—Are the commercial mineral oils carcinogenic? I ask because of the occurrence of a shale oil cancer in the skin of the forearm of a patient of mine who uses shale oil to refine (or grind) lenses in a local optical factory. If mineral oil can be carcinogenic to the skin, is it also carcinogenic to the gastro-intestinal tract when taken by mouth?

RICHARD A. LEONARDO, M.D., Rochester, N. Y.

ANSWER.—The refined mineral oils used for their laxative effect are not carcinogenic either to the skin or to the intestinal tract. Extensive tests have been made on animals with these refined oils and no evidence of carcinogenic action has ever been obtained. On the other hand, some of the crude lubricating oils are carcinogenic, but not invariably so. The carcinogenic properties vary in the oils from different wells and from different parts of the United States. Shale oil has usually considerable carcinogenic qualities, but here again each sample of oil would have to be tested to prove its carcinogenicity. Tests have been made on the English shale oil. No reports published in this country have been found.

Few cases of carcinoma due to lubricating oils have been seen in the United States. In fact, it has been denied that there are any examples in this country. Almost all of the reported instances of lubricating oil cancer were found in England, because some 530 examples occurred in a group of workers known as mule spinners, the machinery they were working spraying oil on their clothing. Their trousers became saturated with oil and most of the cancers appeared on the scrotum. It would be of interest to have a sample of the

shale oil in question tested by painting the skin of white mice, for it is possible that the cancer present is not due to the oil, because such cancers do not appear even in those working with carcinogenic oils if reasonable care is taken to wash the oil off after the day's work.

HIGH FEVER WITH SURVIVAL

To the Editor:—What is the highest temperature to which the human body has been known to reach and still survive?

M.D., Illinois.

ANSWER.—It is difficult to answer this question accurately in view of the large number of case reports of high fever, most of which have not been adequately supported from a scientific point of view. Fever of 106 and 107 F. occurs with sufficient frequency in case reports to lend credence to the reliability of such figures. High terminal temperatures have been reported in the literature sufficiently often to indicate that these may actually go to 110 or 111 F. Such temperatures have been reported in terminal chronic nephritis; in a large number of cases of necrosis of the liver and liver deaths the temperatures have been recorded at 105 to 109. It is difficult to accept the case reports of exceptionally high temperatures (114 F.) such as that reported in 1902 by Holt and those reported in *Time*, July 16 and Aug. 30, 1937, since most of the similar reports actually investigated by competent authorities have demonstrated some fictitious element. It would probably be safe to say that temperatures of between 107 and 108 F. have been recorded for short periods with subsequent recovery and that temperatures of 109 to 110 have been recorded before death. There may be higher temperatures in both groups, but when such occur they should require thorough investigative corroboration before acceptance.

"SULFOMID"

To the Editor:—Is Sulfomid of William P. Poythress & Company, Inc., accepted by the Council on Pharmacy and Chemistry? It is noted in a circular for the product that claims are made that Drs. Dees and Colston of Johns Hopkins Hospital demonstrated that gonorrhea can be rapidly cured by the use of Sulfomid. As I recall the article in THE JOURNAL, Drs. Dees and Colston never mentioned Sulfomid.

L. N. P., Columbus, Ohio.

ANSWER.—Neither Sulfomid nor any other product of William P. Poythress & Company stands accepted by the Council on Pharmacy and Chemistry of the American Medical Association. As it is properly pointed out, Drs. Dees and Colston did not mention Sulfomid in the article in THE JOURNAL. A communication from Dr. Colston informed the editor that the series of cases were treated entirely by sulfanilamide manufactured by the Winthrop Chemical Company, Inc., E. R. Squibb & Sons, and Merck & Co.

This is another example of a drug concern apparently endeavoring to "cash in" on the possibilities of a new drug, endowing it with a fanciful proprietary name. The Council on Pharmacy and Chemistry has already accepted nine brands of sulfanilamide, all of which conform with rigid standards for New and Nonofficial Remedies. There is little excuse, therefore, for using a product marketed under a proprietary name, or for using brands put out by houses that do not cooperate with the Council on Pharmacy and Chemistry.

DIPHTHERIA CARRIERS

To the Editor:—What local treatment is considered effective for diphtheria carriers? What type of isolation is necesary?

WILLARD F. GOFF, M.D., Seattle.

ANSWER.—There is no thoroughly reliable medical procedure for the treatment of diphtheria carriers. Sometimes a spray consisting of 2 per cent aqueous solution of gentian violet seems to be effective. This spray is rather irritating and is objected to by some patients. However, its reactions are not as severe as those produced by the quartz light, for which great efficiency was once claimed.

The most dependable means for freeing the noses and throats of diphtheria carriers from the offending organisms is complete removal of tonsils and adenoids. This surgical measure seldom fails.

If the diphtheria carrier harbors a virulent organism, complete isolation is required for the protection of others. This is especially necessary if the known carriers are employed in institutional work, where large numbers of children may be exposed. It is advisable in the case of chronic diphtheria carriers to have a laboratory conduct tests to determine whether or not the organism is virulent. Carriers with nonvirulent organisms are usually not restricted with regard to their freedom of action.

PLASTIC REPAIR OF EYELID

To the Editor:—A man, aged 55, sustained an automobile accident in which the lids of the right eye were injured. The lower lid was only superficially injured. The right upper lid was cut to the tarsus almost the entire length. At about the middle of the upper lid there is a punched out wound through the entire lid a centimeter in diameter. The intense edema is subsiding and the wound is healing but the circular wound will not close in sufficiently to cover the eyeball. The cornea, lens and iris are getting back to normal. Would the best procedure be to denude the wound of scar tissue or graft new tissue in the lid? The patient's eyes are of medium size and fairly prominent and there is not much redundant skin over the lids. Your minute suggestions will be greatly appreciated.

M.D., Nebraska.

ANSWER.—It will probably be best to wait for complete healing, even if a fistula through the lid develops, and make any repair later that is necessary for the permanent protection of the globe. Operation in the presence of edema and contamination might cause active infection to develop, and the fact that the cornea and globe are improving is further reason for not risking a spread of infection at present. If it becomes apparent that repair of the opening is necessary, there should be careful separation of mucosa from the skin at the opening, and it should then be turned in and the outside defect covered with a small flap from above the eyebrow. It is not a satisfactory place for a free graft to grow.

If healing can be awaited, there will almost assuredly be an elevation of the tarsal border along the cut, and this defect could probably be repaired with a free skin graft after carefully dissecting the tarsal border down into place without going entirely through the lid.

HETEROPHILE ANTIBODIES IN INFECTIOUS MONONUCLEOSIS

To the Editor:—Of how much value do you consider the test for heterophile antibodies (Davidsohn, Israel: *J. Infect. Dis.* **53**: 219 [Sept.-Oct.] 1933) in the diagnosis of infectious mononucleosis? Would a negative test prove the absence of infectious mononucleosis?

ARTHUR R. ABEL, M.D., Orange, N. J.

ANSWER.—The test for heterophile antibodies is specific for infectious mononucleosis, with the one exception of serum sickness. The latter diagnosis can usually be ruled out by the history, clinical picture and blood smear.

The test is nearly always positive for a period varying from one to four weeks during the acute stages of the illness. In the late stages it may be negative in spite of residual fever and a positive blood examination. The test usually becomes positive on about the fifth day of the disease. A negative test during the acute stage of the disease is strong evidence against the diagnosis of infectious mononucleosis.

CHLORINE INHALATIONS IN COLDS

To the Editor:—Kindly give me the scientific status, the practical application and the methods of procedure in vogue for the use of chlorine inhalations in colds.

M.D., Florida.

ANSWER.—The inhalation of chlorine in the treatment of colds has been largely abandoned. Many reasons contributed to its abandonment. Among them was the difficulty in maintaining a concentration of chlorine within the narrow effective limit. The original article dealing with this subject was published by Vedder and Sawyer in THE JOURNAL, March 8, 1924, page 764. A further article by the same authors appeared in THE JOURNAL, Jan. 31, 1925, page 361. This article describes an apparatus devised by the authors for the administration of the treatment.

No publication in the English literature dealing with this subject has been listed in the *Quarterly Cumulative Index-Medicus* since 1926 and none of the contemporary publications add materially to information given in the references cited.

WHEAT GERM AND CANCER

To the Editor:—An article in the Los Angeles *Times* attributed the growth of cancer to the ingestion of wheat germ. The last part of this article states that the dangers to human beings appear to be ruled out because if the rats were fed wheat germ oil that had been extracted under pressure they did not develop cancer. In this city there is a large amount of wheat germ sold in bulk and used as a cereal for vitamin purposes. It is being used in this way by one of my patients and with apparent benefit for median nerve neuritis. Please send me any further information as to the dangers of the habitual use of the wheat germ as a breakfast cereal.

M.D., California.

ANSWER.—The original article of Dr. Rowntree regarding the effect of a crude wheat germ oil appeared in November 1937 issue of the *American Journal of Cancer*. It is to be noted that only this special crude type of preparation produces tumors. There is no danger, as far as is known at present, of producing tumors in persons using the common wheat germ preparations on the market.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 28. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, March 1. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: *Basic Science.* Tucson, March 15. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Medical (Regular).* Little Rock, June 21-22. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Medical (Eclectic).* Little Rock, June 21. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Reciprocity.* Los Angeles, Feb. 23, San Francisco, May 11, Los Angeles, July 11, San Francisco, Sept. 14, and Los Angeles, Nov. 16. *Written examinations.* Los Angeles, March 7-10, San Francisco, June 27-30, Los Angeles, July 11-14, and Sacramento, Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, Feb. 12. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical (Regular).* Hartford, March 8-9. *Endorsement.* Hartford, March 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, March 8. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 12-14. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, June 27-28. Asst. Sec., Commission on Licensure, Mr. Paul Foley, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, April 5-6. Commissioner of Law Enforcement, Hon. J. L. Balderston, 205 State Capitol Bldg., Boise.

ILLINOIS: Chicago, April 5-7, June 28-July 1, and Oct. 18-20. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 21-23. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: *Medical.* Kansas City, June 7-8. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City. *Basic Science.* Topeka, July 8-9. Address, State Superintendent of Public Instruction, Topeka.

KENTUCKY: Louisville, June 8-10. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. 3rd St., Louisville.

MAINE: Portland, March 8-9. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State Street, Portland.

MARYLAND: *Medical (Regular).* Baltimore, June 21-24. Sec., Dr. John T. O'Mara, 1211 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 21-22. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, March 8-10. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Ann Arbor and Detroit, June 15-17. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MISSISSIPPI: Jackson, June. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, April 5-6. Sec., Dr. S. A. Cooney, 205 Power Block, Helena.

NEVADA: *Reciprocity.* Carson City, Feb. 7. Sec., Dr. John E. Worden, Capitol Bldg., Carson City.

NEW HAMPSHIRE: Concord, March 10-11. Sec., Board of Registration in Medicine, Dr. Fred E. Clow, State House, Concord.

NEW JERSEY: Trenton, June 21-22. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 11-12. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 27-30 and Sept. 19-22. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 13. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

OKLAHOMA: *Basic Science.* Oklahoma City, May 4. Sec. of State, Hon. Frank C. Carter, State Capitol Bldg., Oklahoma City. *Medical.* Oklahoma City, June 8-9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, March 19, Corvallis, July 16, and Portland, Nov. 19. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PUERTO RICO: Santurce, March 1. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

SOUTH CAROLINA: Columbia, June 28. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 8. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 22-24. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Huntington, March 21-23. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science.* Madison, April 2. Sec., Prof. Robert N. Baxter, 3414 W. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Feb. 7. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners* and *Special Boards* were published in THE JOURNAL, January 29, page 391.

Rhode Island October Examination

Mr. Robert D. Wholey, chief, Division of Examiners, reports the oral, written and practical examination held at Providence, Oct. 7-8, 1937. The examination covered 20 subjects and included 50 questions. An average of 80 per cent was required to pass. Ten candidates were examined, 7 of whom passed and 3 failed. Five physicians were licensed by endorsement after an oral examination. The following schools were represented:

PASSED School	Year Grad.	Per Cent
Georgetown University School of Medicine	(1935)	94
Rush Medical College	(1934)	87.5
Boston University School of Medicine	(1934)	86
Tufts College Medical School	(1935)	80
Columbia University College of Physicians and Surgeons	(1935)	95
Hahnemann Medical College and Hospital of Philadelphia	(1936)	80
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest	(1932)	80

FAILED School	Year Grad.	Per Cent
Boston University School of Medicine	(1936)	74
Tufts College Medical School	(1936)	62
Long Island College of Medicine	(1936)	70

LICENSED BY ENDORSEMENT School	Year Grad.	Endorsement of
Yale University School of Medicine	(1934)	N. B. M. Ex.
Georgetown University School of Medicine	(1936)	N. B. M. Ex.
Tufts College Medical School	(1936, 2)	N. B. M. Ex.
University of Pennsylvania School of Medicine	(1932)	N. B. M. Ex.

Kansas December Report

Dr. J. F. Hassig, secretary, Kansas Board of Medical Registration and Examination, reports the written examination held at Topeka, Dec. 14-15, 1937. The examination covered 10 subjects and included 150 questions. An average of 75 per cent was required to pass. Six candidates were examined, all of whom passed. Ten physicians were licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

PASSED School	Year Grad.	Per Cent
University of Illinois College of Medicine	(1935)	84.9
University of Louisville School of Medicine	(1937)	83.2
Creighton University School of Medicine	(1937)	83, 84.3
University of Oklahoma School of Medicine	(1937)	87.4
University of Pennsylvania School of Medicine	(1930)	79.2

LICENSED BY RECIPROCITY School	Year Grad.	Reciprocity with
Chicago College of Medicine and Surgery	(1908)	Illinois
Northwestern University Medical School	(1907)	Illinois
University of Illinois College of Medicine	(1925)	Illinois
University of Louisville School of Medicine	(1934), (1936)	Kentucky
St. Louis University School of Medicine	(1936)	Missouri
Washington University School of Medicine	(1934, 2)	Missouri
University of Nebraska College of Medicine	(1934)	Nebraska
Jefferson Medical College of Philadelphia	(1926)	Penna.

LICENSED BY ENDORSEMENT School	Year Grad.	Endorsement of
Northwestern University Medical School	(1935)	N. B. M. Ex.
Washington University School of Medicine	(1918)	N. B. M. Ex.

New Mexico October Report

Dr. Le Grand Ward, secretary, New Mexico Board of Medical Examiners, reports the written examination held in Santa Fe, Oct. 11-12, 1937. The examination covered 13 subjects. An average of 70 per cent was required to pass. One candidate was examined and passed. Twenty-three physicians were licensed by endorsement. The following schools were represented:

PASSED School	Year Grad.	Per Cent
Universidad de Chile Facultad de Ciencias Médicas, Santiago	(1933)	90.2

LICENSED BY ENDORSEMENT School	Year Grad.	Endorsement of
University of Arkansas School of Medicine	(1927)	Arkansas
College of Medical Evangelists	(1914)	California
University of Colorado School of Medicine	(1930), (1935)	Colorado
College of Physicians and Surgeons of Chicago	(1903)	Illinois
Loyola University School of Medicine	(1933)	New York, (1937) Illinois
Rush Medical College	(1934)	Maryland, (1937) Illinois
University of Illinois College of Medicine	(1932), (1933)	Illinois
Tulane University of Louisiana School of Medicine	(1934), (1936)	Louisiana
College of Physicians and Surgeons of Baltimore	(1908)	W. Virginia
University of Michigan Department of Medicine and Surgery	(1899)	New Jersey
University of Michigan Medical School	(1934, 2)	Michigan
Duke University School of Medicine	(1933)	Michigan
University of Nashville Medical Department	(1908)	Tennessee
Baylor University College of Medicine	(1929)	Texas
University of Virginia Department of Medicine	(1926)	Texas
University of Western Ontario Medical School	(1930)	Ontario
Hamburgische Universität Medizinische Fakultät	(1933)*	Colorado

* Verification of graduation in process.

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Book Notices

The Scientific Basis of Physical Education. By F. W. W. Griffin, M.A., M.D., B.Ch., Medical Adviser to the Incorporated Lucas-Tooth Boys' Training Fund (Lucas-Tooth Gymnasium, London). With a foreword by Sir E. Kaye Le Fleming, M.A., M.D., B.Ch., Chairman of Council, British Medical Association. Cloth. Price, $2.75. Pp. 203, with 7 illustrations. New York & London: Oxford University Press, 1937.

This volume approaches the subject of physical education from a new angle, that of the physician who supervises or advises with regard to the program of activities. It reflects very wide reading, as evidenced by the more than 200 references in the bibliography, and includes the most recent work. The material is presented in good form and style and most of it is convincing, the least so being the portion in which the author tries to justify breathing exercises taken as such and without regard to the physiologic needs of the body at the time. Most United States physiologists during recent years have felt that deep breathing should be practiced only in response to the requirements of the body for more oxygen. The physiology and mechanics of exercise are reviewed and the recent investigations from many sources are brought together in small compass. Unusual and significant material includes a discussion of the psychologic aspects of physical achievement, an important phase usually overlooked altogether; and a section presenting some work on optimal rates of exercise, such as walking, in terms of oxygen needs and caloric expenditures, and formulas for calculating the work done in an exercise such as climbing stairs. If some one could only determine the optimal amount of exercise for any individual! Here the busy person interested in really intelligent work in physical education will find material for which he would have to search many long hours if he went to original sources. It is a valuable contribution.

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The Thinking Body: A Study of the Balancing Forces of Dynamic Man. By Mabel Elsworth Todd. Foreword by E. G. Brackett, M.D. Cloth. Price, $4. Pp. 314, with 91 illustrations. New York & London: Paul B. Hoeber, Inc., 1937.

This is an unusual book in content and in style. It approaches health and posture from the engineering point of view but evidences an exact knowledge of mechanics, anatomy, physiology and posture, as well as considerable psychology and philosophy. The style is terse, forceful, sometimes picturesque, often reminiscent of Victor Hugo. That such a style may sacrifice accuracy at times is shown by this statement at the beginning of chapter VIII: "To breathe is life, without breath we die, to breathe rhythmically is health." This scans well and sounds well but, when one analyzes the thought, one is compelled to doubt whether breathing rhythmically is health always and without the fulfilment of other conditions.

The technical material is presented excellently and thoroughly. It should be helpful to physicians, orthopedists, physical therapists, physical educators—to all who are attempting to aid people in conserving muscular and nervous energy in their daily tasks. However, it is not easy reading for one without technical knowledge and probably is not intended for him. The illustrations are clear and helpful.

A novel and useful emphasis in the work is placed on mental and physical preparation for effort, an emphasis which is given practically by athletic coaches and trainers but hasn't so often been put into words to indicate a prerequisite for the most effective and economical performance. The importance of balance and proper relation of different parts of the body is discussed properly and in detail.

If unfavorable criticisms were to be joined to the vastly more numerous favorable ones deserved there might be two: first, that the title is misleading although catchy, in that the text seems to discuss a body thought about rather than thinking; second, and much more important, that when the author comes to practical applications of her excellent theories she speaks more like a dancer and less like a scientist, more artistically and mystically than clearly. For example, "To balance bodily forces think down the back and up the front. Let the spine drag, but keep the front of the body up. . . . Thinking up the front of the body without lifting any of its bony parts will maintain proper traction." To the neophyte this "thinking" of a part of the body up without moving it appears difficult and perhaps not quite cricket. But this may be petty caviling and the more expert for whom the book is intended may have no difficulty with it in any part. To them it should be a valuable contribution, and to the reader of average intelligence who is interested in posture a stimulating and thought-provoking work.

Vāgbhata's Aṣṭāṅgahrdayasamhitā: Ein altindisches Lehrbuch der Heilkunde. Aus dem Sanskrit ins Deutsche übertragen mit Einleitung, Anmerkungen und Indices. Von Luise Hilgenberg, Dr. med., Dr. phil., und Willibald Kirfel, ord. Prof. für indische Philologie an der Universität Bonn. Erste Lieferung. Paper. Price, 3.50 guilders. Pp. 64. Leiden: E. J. Brill, 1937.

Of all the great textbooks of Indian medicine the one written by Vāgbhata before the eighth century A. D. was least known in the Western world, as it had never been translated into any European language. Complete English translations of the works of Sushruta and Charaka have been available for some time, and yet the textbook of Vāgbhata enjoyed just as much popularity in India if not even more. More manuscripts have been preserved and more commentaries were written on this than on any other Indian medical book. It was translated into Tibetan and became part of the Buddhist canon of the Lamaic church. The book was written in verse like other similar textbooks of medicine and was memorized by generations of Indian physicians. The present translation is extremely welcome. It fills an important gap in the historical literature of medicine and is an admirable piece of work—the result of the cooperation of Professor Kirfel, who is not only an Indologian but also well versed in the scientific literature of India, and of Dr. Hilgenberg, who besides being a philologist is a physician as well. There is no doubt that the best way to approach such difficult ancient texts is through the close cooperation of philologists and physicians. The Sanskrit text was printed in Bombay in 1891, and the translators have not attempted to render it in verse form. Their prose translation reads smoothly. Drug names and technical terms have been translated, but in each case the Sanskrit term is given in brackets. Difficulties are explained in extensive footnotes. Vāgbhata's book is divided into six sections and 120 chapters dealing with theoretical foundations of medicine, anatomy and physiology, etiology, cures and the preparation of drugs, and ending with chapters on the nursing of children and their diseases, mental diseases, diseases of the eyes and ears, and venereal diseases. The two parts published so far contain the first twenty-five chapters of the book, beginning with interesting definitions. For instance: "Physician, remedy, nurse, and patient are the four factors and in therapy four qualities are attributed to each of them. The physician must be skilful, must have received his science from a most worthy teacher, must have had practical experience and be honest . . . and the patient must be wealthy, devoted to the physician, communicative, and of good character." These first twenty-five chapters discuss hygienic rules, diets and other general treatments, and they are all full of material of greatest interest not only to the history of medicine but to the history of civilization as well.

Textbook of Materia Medica, Pharmacology and Therapeutics. By A. S. Blumgarten, M.D., F.A.C.P., Associate Attending Physician to the Lenox Hill Hospital, New York. Seventh edition. Cloth, Price, $3. Pp. 845, with illustrations. New York: Macmillan Company, 1937.

The fact that this is the seventh revised and reset edition of this standard book on materia medica, pharmacology and therapeutics for nurses is in itself proof of its established value. It aims to teach nurses "to observe the effects of drugs on patients, to recognize the earliest toxic symptoms, to understand the objectives of the physician in prescribing a remedy, and to administer a remedy in such a manner that the maximum desired effect is obtained." Each chapter is followed by questions of three types: the research type, the unfinished type, and those which emphasize the practical aspects of the subject. There is a rather extensive introduction on the administration of medicines including methods of dose calculation. The book concludes with chapters on medicinal foods and physical therapy. When one contemplates the 778 closely printed pages, the contents of which the pupil of nursing is supposed to assimilate in the relatively few hours she can devote to such study, one wishes that this book were considered merely as a reference handbook.

Medical Leaves, 1937. Editor in Chief: Joseph C. Beck, M.D., Editors: Hershel Meyer, M.D., Irwin Rubell, M.D., and Louis Parmacek, M.D. Published under the auspices of the Histadruth. Paper. Price, $2. Pp. 198. Chicago: Medical Leaves, Inc.; New York: Jewish Frontier, 1937.

This volume is distributed with the purpose of raising money to aid the Jewish Frontier and League for Labor Palestine. It contains an assemblage of individual contributions on a variety of subjects, ranging from an essay on the pituitary gland and its hormones by J. B. Collip and on backache by Julius Friedenwald to an essay on "The Atmosphere of Books" by Dr. William Mayo. Much of the material is reprint and reiteration. It is to be hoped that any future publications of similar character may be planned according to some definite scheme. Unfortunately, far too many volumes of this type serve merely as repositories for essays which could not find publication elsewhere. No doubt it requires extraordinary courage on the part of an editor of such a publication to reject material not equal to the highest standards of medical literary competence.

Allgemeine und spezielle chirurgische Diagnostik: Ein Lehrbuch für Studierende und Ärzte. Von Professor Dr. Max Kappis, Direktor der Chirurgischen Universitäts-Klinik, Würzburg. Second edition. Paper. Price, 23 marks. Pp. 736, with 550 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1937.

Although extensively rewritten, this edition resembles the first, especially as far as the distribution of the material is concerned. The first part discusses the general principles of surgical diagnosis and the general and local symptomatology. The second part describes the general surgical diagnosis and is subdivided into chapters dealing with various types of injuries, the healing process, different kinds of surgical infections and, finally, surgical diseases arranged according to the tissues involved. The third part is devoted to special, i. e., regional surgical diagnosis. The wisdom of such arrangement of the material is doubtful, as overlapping and repetitions are unavoidable. As the differential diagnosis did not receive due consideration and the subject is chiefly of a character found in textbooks on general surgery, the title of the work is somewhat of a misnomer. A few omissions are noteworthy: parathyroid tumors, terminal ileitis and granuloma inguinale. Illustrations are plentiful and deserve commendation. Altogether the book must be considered useful not only for a surgeon but for a general practitioner, because of the wealth of important material presented in a simple, adequate manner.

Personality and Other Things (a Semi-Autobiography). By Harold Hays, M.D., F.A.C.S. (Introduction by Dr. Henry C. Link.) Cloth. Price, $2. Pp. 163, with one illustration. New York: American Physicians, Inc., 1937.

In this book the author has combined a number of miscellaneous writings, leading with a statement as to why he became interested in writing and explaining the value of personality in a successful career. The book contains many references to leaders in medical and other affairs with whom the author has been associated from time to time. The volume concludes with a short story and poem. While the book contains much that is useful and suggestive, it is sad to observe the selection of books which Dr. Hays would recommend as part of every physicians' library. The last two books are those of Dale Carnegie and Adolph Lorenz. Dr. Hays ought to know better.

The Abdominal Surgery of Children. By Sir Lancelot Barrington-Ward, K.C.V.O., Ch.M., F.R.C.S., Surgeon to H. M. The King. Second edition. Cloth. Price, $9. Pp. 333, with 101 illustrations. New York & London: Oxford University Press, 1937.

The preface contains the remark that the adult may safely be treated as a child but that the converse can lead only to disaster. To be successful in the abdominal surgery of children the surgeon must be familiar with certain diseases peculiar to the child, such as status lymphaticus, congenital pyloric stenosis, intussusception, and hernia of the umbilical cord. In this volume the genito-urinary system has been omitted by the author except as far as it touches the general surgery of the abdomen. Some chapters of the second edition have been rewritten and others amplified; the easily readable text is accompanied by numerous illustrations and four color plates; at the end of each chapter is a short bibliography. A few opinions deserve special attention: Preoperative purgation, enemas and starvation should be abandoned; avoidance of purgation is observed during the postoperative period; no ill effects from morphine have ever been noticed by the author; the rectal tube is considered useless; for appendectomy the use of the paramedian incision with lateral displacement of the rectus muscle is recommended; finally, he is convinced that one of the factors in successful abdominal surgery in the child is drainage. The smooth style, simplicity of presentation and good illustrations of this work will meet with instant approval by surgeons and may be wholeheartedly recommended.

Our Children in a Changing World: An Outline of Practical Guidance. By Erwin Wexberg, M.D., Professor of Neuro-psychiatry, Louisiana State University, with Henry E. Fritsch. Cloth. Price, $2. Pp. 232. New York: Macmillan Company, 1937.

Each year, more and more child guidance groups are being formed. These groups base their efforts on the belief that all children can be made useful members of society; that behavior disturbances which arise are the result of detrimental influences in the environment. The adlerian school believes that behavior problems cannot be satisfactorily solved without considering the underlying maladjustment in the child's personality. When children present behavior problems, it is the belief of this school that there must always be a successful adjustment of the child's entire personality rather than the elimination of a few unrelated symptoms. This book is written on the basis of that belief. There is first a discussion of the development of personality and the factors of environment. Next there is a presentation of the types of children, such as the lying, timid and fearful child. Bad habits and nervous symptoms are considered, followed by a discussion of education and corrective measures. Parents undoubtedly would benefit to a great extent by carefully reading a book of this type. It will be found useful also to teachers and social workers.

On Percussion of the Chest. Being a Translation of Auenbrugger's Original Treatise Entitled "Inventum novum ex percussione thoracis humani, ut signo abstruos interni pectoris morbos detegendi." [Vienna, 1761.] By John Forbes, M.D. [London, 1824.] Introduction by Henry E. Sigerist. Boards. Price, 75 cents. Pp. 31, with 2 illustrations. Baltimore: Johns Hopkins Press, 1936.

This is a reprint of the translation of Auenbrugger's original treatise by John Forbes in 1824, to which there is a brief introduction by Henry E. Sigerist. It took Auenbrugger seven years to work out his method, and half a century passed before the method had general adoption. In 1821 Forbes published a translation of the book by R. T. H. Laënnec on auscultation. Five editions of that work were published between 1821 and 1838. The edition published in 1824 included also this translation of the treatise by Auenbrugger.

Disorders of the Blood: Diagnosis, Pathology, Treatment and Technique. By Lionel E. H. Whitby, C.V.O., M.C., M.D., Assistant Pathologist, The Bland-Sutton Institute of Pathology, the Middlesex Hospital, and C. J. C. Britton, M.D., D.P.H., Assistant Pathologist, The Bland-Sutton Institute of Pathology, the Middlesex Hospital, London. Second edition. Cloth. Price, $7.50. Pp. 582, with 72 illustrations. Philadelphia: P. Blakiston's Son & Co., 1937.

The first edition was published in 1935. The advances made in our study of the blood since that time are represented in this book by thirty-five extra pages and seven new illustrations and also some 400 changes in the bibliography. The authors point out that this edition stresses the value of classifying the anemias in terms of cell size and hemoglobin concentration. The place made for itself by the first edition is likely to be held by the new volume.

Maternal Deaths—The Ways to Prevention. By Iago Galdston, Secretary, Medical Information Bureau of the New York Academy of Medicine. Cloth. Price, 75 cents. Pp. 115. New York: Commonwealth Fund; London: Oxford University Press, 1937.

In 1933 the Commonwealth Fund published a monograph entitled "Maternal Mortality in New York City, A Study of All Puerperal Deaths 1930-1932." This study was intended primarily for the medical profession. Galdston has taken the data obtained from this study and has adapted it to the public. There is no doubt about the justification for such a presentation because maternal welfare is not solely a medical problem.

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Social and economic factors enter into it. The book is divided into chapters devoted to preventable deaths, antepartum care, the attendant at delivery, midwife practice, place of delivery, operative versus spontaneous delivery, cesarean section, anesthesia and analgesia, and abortion. In the last chapter the author discusses what can be done to bring about improvement in maternal welfare. In an appendix he discusses the community organization in Cleveland as an illustration of the type of medical organization which large communities can create to improve the quality of obstetric service rendered. This book has a definite mission and should help to bring about some improvement in the deplorable state of affairs that exist at present in this country and elsewhere in the care of parturient women.

Diagnosis and Non-Operative Treatment of the Diseases of the Colon and Rectum. By Gottwald Schwarz, M.D., Professor, University of Vienna, Jacques Goldberger, M.D., Consulting Physician, Carlsbad, and Charles Crocker, M.D. Cloth. Price, $10.50. Pp. 540, with 255 illustrations. New York: Paul B. Hoeber, Inc., 1937.

This book emphasizes the importance of roentgenology and proctosigmoidoscopy in diseases of the colon and rectum. The diplocoptic method of proctosigmoidoscopy is presented and recommended as superior to the methods now in general use. The illustrations obtained by the use of this method are excellent. The general discussions are clear and concise. Case reports are presented briefly and illustrate the text very well. Dietary management is given in detail. This is an excellent volume for the general practitioner and a valuable addition to the library of the specialist.

Die inneren Erkrankungen im Alter. Von Univ.-Prof. Dr. Albert Müller-Deham. Paper. Price, 24 marks. Pp. 408, with 6 illustrations. Vienna: Julius Springer, 1937.

There have been few books published on diseases peculiar to old persons; hence this exhaustive compilation should be valuable to both the practitioner and the student. Although the author presents little that is new, the diseases that may occur in old age are nicely arranged according to the various systems. The author had the rare privilege of having the late Professor Erdheim as collaborator. He had a large hospital practice, devoted almost exclusively to old persons, and his careful clinical studies were all checked by Professor Erdheim at necropsy. The pathologic and biologic phases of this subject are exceptionally well done. The problems of arteriosclerosis and hypertension and cancer are exhaustively handled. Contrary to most books from Vienna, treatment is given in full detail and with special emphasis. The text is clear and the illustrations are ample.

Not So Long Ago: A Chronicle of Medicine and Doctors in Colonial Philadelphia. By Cecil K. Drinker, M.D., Sc.D., Professor of Physiology and Dean of the School of Public Health, Harvard University. Cloth. Price, $3.50. Pp. 183, with 20 illustrations. New York: Oxford University Press, 1937.

The author's great great grandmother lived in Philadelphia and kept a diary from 1758 to 1807. She had many grandchildren, and the medical experiences of this large family were her primary concern. Many important physicians attended these children in their illnesses. In the diary, as here presented, the author intersperses much information between exact excerpts from the diary with the original English and spelling. The whole book makes a marvelous picture of the nature of medical practice in that time. Many famous physicians, including Benjamin Rush, William Shippen, John Bard and Philip Physick, pass through its pages. The book gives not only an excellent picture of the medical practice of its time but also an interesting insight into the beginnings and prosecution of the War of the Revolution.

Physicians' Guide Book for Mothers. By G. G. Keener, M.D. Cloth. Price, $1. Pp. 62. Kingsport, Tennessee: Southern Publishers, Inc., 1936.

With much attention centered on the reduction of neonatal and maternal mortality, a variety of books concerning care during pregnancy have appeared. Simply outlined in a few brief pages, this book presents the essentials of antepartum and postpartum care. Mothers may find it of some help in following the advice of the physician. The instructions given are simple and easily followed, while the regular care of the physician is stressed.

Les immunités, locales. Par A. Besredka, professeur à l'Institut Pasteur. Paper. Price, 35 francs. Pp. 224. Paris: Masson & Cie, 1937.

The subject of this book is local immunity in general as well as its manifestations, as viewed by the author, in the skin, the lungs, the pleura, the peritoneum, the meninges, the intestines and the spleen and in plants. The last chapter deals with local passive immunity. The presentation tends to be dogmatic and frequently the evidence brought forward in support of positive statements does not seem to be conclusive.

The Story of Motherhood. By Roy P. Finney, M.D. Cloth. Price, $3. Pp. 359, with 17 illustrations. New York: Liveright Publishing Corporation, 1937.

This is another of the large number of books written in recent years to acquaint the public with the story of childbirth throughout the ages. The author is listed in the American Medical Directory as a urologist practicing in Spartanburg, S. C., but presumably he is also interested in obstetrics and the history of obstetrics. The contents of this book are essentially the same as those of the other books on this subject. To the sixteen illustrations in the text the author adds one of himself as a frontispiece. The book is well written.

A Medical History of Liverpool from the Earliest Days to the Year 1920. From the data collected by the Late Thomas H. Bickerton, Ch.M., F.R.C.S. Edited by H. Richard Bickerton and R. M. B. MacKenna. Cloth. Price, 21s. Pp. 313, with 81 illustrations. London: John Murray, 1936.

This handsome tome is a fine contribution to the history of medicine magnificently printed, illustrated and bound. Its detail, however, is so great that it must ever remain, except for those intimately concerned with Liverpool, a work of reference. It is supplemented with numerous tables of names of persons concerned with the development of the medical institutions of Liverpool and with a bibliography of the literature on the subject. On her record of the past, Liverpool looks forward most optimistically to the development of medicine in the future.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospital Services: Liability of County for Hospital Expenses of Indigents.—One Frank Palmer was a dependent poor person of Cache County, Utah. Between May 3 and May 19, 1934, he was treated at the plaintiff hospital, the county commissioners having authorized an operation for the removal of one of his toes. On May 19, Palmer was released from the hospital and taken to a hotel where he had previously resided. A few hours later, he became suddenly ill and the manager of the hotel made several unsuccessful attempts to get in touch with the county commissioners for authorization to return him to the hospital. Finally the county clerk procured an ambulance and had Palmer removed to the hospital for further attention. Two or three days thereafter, Palmer's leg was amputated and he remained in the hospital for several months. In September, a bill for four months' hospitalization was presented to the county commissioners and later the county paid one third of the bill. The hospital then instituted suit to collect the other two thirds, or $385. The trial court gave judgment for the county, and the hospital appealed to the Supreme Court of Utah.

The hospital contended first that the county clerk had authority in cases of emergency to authorize hospital care if the commissioners could not be reached. While, said the Supreme Court, it seems natural and necessary that some one should have authority to consign an emergency case to the hospital if none of the commissioners are available, the court could not say that the finding of the trial court that the county clerk had no such authority was not sustained by the evidence. The hospital further contended that the county had in fact recognized Palmer as an indigent and had already assumed his care, that the law imposed on the county a duty of caring for indigents, and that a third person who performed that duty may recoup the cost incident thereto much like a third person

supplying a wife with necessaries for the family may sue a husband who has not expressly or impliedly contracted for the necessaries. While the law does impose on county commissioners, said the court, the duty of caring for the indigent sick, a statute limits the levy that may be imposed for the care of indigents, county hospitals, etc., to one mill. Under this statute, the amount which could be raised was approximately $23,000. The county introduced evidence to show that it would require, on the average, $69,000 a year to take care of the indigents and that it therefore gets only one third of this amount from the one mill tax. A requirement imposed on an official or board to expend money, the court observed, is not a duty past the amount available. It was argued, however, that the hospital was entitled to its money as long as there were funds available. If this were true, the court said, it would mean that the funds would be exhausted by those who were first served, and those who came afterward could obtain no relief.

The patient's leg was not amputated until two or three days after his return to the hospital. In that time the hospital had an opportunity to get in touch with the commissioners. The hospital assumed, however, that it could collect for the expenses incident to caring for Palmer because the county had paid in full for the previous period. But, said the court, it could not base a claim on reliance on that fact. It may base a claim for hospitalization for the brief period it took care of the patient pending the time it could get authorization from the county, and if, during this period, it was necessary to amputate the leg, it could do that and could charge for such hospitalization. But a person who gives relief in an emergency because the matter is too imminent to permit of the obtaining of authorization must at the first opportunity get in contact with those who are liable and obtain authorization for further care. If that is not given, he can recoup only for such services and care as are necessary to administer so as to put the patient in a condition in which he may be safely removed. He may obtain remuneration for such period. Having obtained the victim under an emergency, he does not have to relinquish him before it is safe to move him, even if the authorities fail to extend authorization. The hospital was remiss, in the opinion of the court, in not getting in touch with the commissioners as soon as possible after Palmer came to it instead of placing reliance on a former action of such commissioners.

The Supreme Court, however, remitted the case with instructions to take additional evidence on the question of whether the hospital had as a matter of fact endeavored to get in touch with the county before the amputation of the leg; if so, and it had not succeeded, how long after the amputation it was necessary to keep Palmer before it would be safe to move him. If the cost of hospitalization for such a period was more than the amount paid by the county, the hospital was to obtain judgment for such additional amount. If the trial court should find that the plaintiff failed to use reasonable efforts to contact the county commissioners before the amputation, then the original judgment was to stand.—*Cache Valley General Hospital v. Cache County (Utah), 67 P. (2d) 639.*

Paternity: Judicial Notice of Landsteiner Blood-Grouping Test.—In this bastardy proceeding, the plaintiff charged that the defendant, aged 70 years, was the father of her illegitimate child. The defendant denied having had intercourse with the plaintiff and further testified, in which testimony he was corroborated by his wife, that he had been impotent for a number of years. The trial court, with the consent of the parties, appointed a physician to make a Landsteiner blood-grouping test of the plaintiff, the defendant and the baby. The physician did so and reported that the test placed the mother and the putative father in group O and the baby in group B. He testified that the baby could not be the issue of the plaintiff and the defendant. The trial judge, who tried the case without a jury, nevertheless entered a judgment in favor of the plaintiff. The defendant, the putative father, appealed to the district court of appeal, second district, division 2, California.

The sole question before the court was whether or not there was substantial evidence to sustain the finding of the trial court. The law is settled, said the court, that courts will take judicial notice of all matters of science and common knowledge. Hence the court will take judicial notice of the Landsteiner blood grouping and the results derived therefrom on test, which the court described in the following language:

> The Landsteiner blood groupings in parents and children are as follows:
> (The letters signify the blood types of the respective individuals)
>
> | Groups of Parents | Groups of Children Possible | Groups of Children Not Possible |
> |---|---|---|
> | 1. O × O | O | A, B, AB |
> | 2. O × A | O, A | B, AB |
> | 3. O × B | O, B | A, AB |
> | 4. A × A | O, A | B, AB |
> | 5. A × B | O, A, B, AB | * * * |
> | 6. B × B | O, B | A, AB |
> | 7. O × AB | A, B | O, AB |
> | 8. A × AB | A, B, AB | O |
> | 9. B × AB | A, B, AB | O |
> | 10. AB × AB | A, B, AB | O |
>
> Briefly the Landsteiner blood-grouping test operates in the following manner: There are three allelomorphic genes, A, B, and O, which determine blood groups. There is one locus for these genes in each single pair of chromosomes and at this locus only one of the three genes can occur. A and B determine the presence of the agglutinogens A and B, and O the absence of agglutinogen. In the formation of the germ cells the pairs of chromosomes separate and each germ cell contains only one of each pair and therefore only one of the three genes. From combinations of the three possible kinds of sperms with the three possible kinds of ova six different genotypes result. Genes A or B, accordingly, are dominant over O; which means that if gene A or B is present even though combined with gene O, then the individual will possess agglutinogen A or B.
>
> The agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents, since they are inherited as mendelian dominants. If either parent belongs to group AB, his or her genotype is AB, so half the germ cells will contain gene A and half gene B. Every child will therefore possess at least one A or B gene and cannot belong to genotype OO or group O. On the other hand, if either parent belongs to group O or genotype OO, all the children must possess at least one O gene, so that children of group AB are impossible.

The medical profession, said the court, accepts the results of the Landsteiner blood-grouping test as conclusive evidence in cases in which it shows nonpaternity. The physician who made the blood-grouping tests in the present case testified that the tests showed that the defendant could not be the baby's father; hence the finding that the defendant was the father of the baby was not supported by substantial evidence. The judgment of the trial court was therefore reversed.

In passing, the court said, the blood-grouping test requires only a few drops of blood, is painless and in no way is prejudicial to health. Since the charge of paternity is one easy to make and very difficult to disprove, it would tend to simplify this problem, when it is presented to the courts for determination, and would be a distinct advance in the science of jurisprudence, if the California legislature would adopt an amendment to the Code of Civil Procedure providing that whenever it shall be relevant to the prosecution or the defense in an illegitimacy action the trial court may direct the complainant, her child and the defendant to submit to one or more blood tests to determine whether or not the defendant can be excluded as being the father of the child and making the result of the test admissible in evidence only in cases in which definite exclusion is established. Such a statutory provision has been enacted in New York and Wisconsin, the court said.—*Arais v. Kalcusnikoff (Calif.), 67 P. (2d) 1059.*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association, Chicago, Feb. 24-26. Dr. Norvelle C. La Mar, 210 East 68th St., New York, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 14-15. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.

Federation of American Societies for Experimental Biology, Baltimore, March 30-April 2. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.

Pacific Coast Surgical Association, Los Angeles, Feb. 22-25. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.

Southeastern Surgical Congress, Louisville, Ky., March 7-9. Dr. B. T. Beasley, 701 Hurt Bldg., Atlanta, Ga., Secretary.

Tri-States Medical Association of the Carolinas and Virginia, Asheville, N. C., Feb. 21-22. Dr. J. M. Northington, 804 Professional Bldg., Charlotte, N. C., Secretary.

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Current Medical Literature

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The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, New York

94: 505-758 (Nov.) 1937

Correlations of Behavior and Neuropathology in Case of Cerebral Palsy from Birth Injury. A. Gesell and H. M. Zimmerman, New Haven, Conn.—p. 505.
Puerperal Psychoses and Their Sequels. L. J. Karnosh and J. M. Hope, Cleveland.—p. 537.
Development of Family Care in New York State. H. G. Hubbell, Newark, N. Y.—p. 551.
Mental Reactions and Their Management in Patients with Cardiac Disease. P. H. Drewry Jr. and J. H. Wall, White Plains, N. Y.—p. 561.
*Behavior of Children Receiving Benzedrine. C. Bradley, East Providence, R. I.—p. 577.
Effect of Benzedrine Sulfate on Intelligence Scores of Children. M. Molitch, Philadelphia, and A. K. Eccles, Jamesburg, N. J.—p. 587.
Psychiatric Study of Recidivists. C. B. Thompson, New York.—p. 591.
Mental Changes Following Removal of Right Cerebral Hemisphere for Brain Tumor. S. N. Rowe, Pittsburgh.—p. 605.
Defects of Intelligence from Focal Lesions Within Central Part of Left Cerebral Hemisphere. L. B. Alford, St. Louis.—p. 615.
*Sodium Amytal as Substitute for Tube Feeding. W. H. Foley and V. P. Rossignoli, Providence, R. I.—p. 639.
Primary Affect Hunger. D. M. Levy, New York.—p. 643.
Child Analysis as Technic in Investigation of Mental Mechanisms: Illustrated by Study of Enuresis. Margaret W. Gerard, Chicago.—p. 653.
Child Psychiatry. J. S. Plant, Newark, N. J.—p. 665.
Some Therapeutic Principles Applicable to Psychiatric Work with Children. F. H. Allen, Philadelphia.—p. 671.
Evaluation of Treatment of Problem Children as Determined by Follow-Up Study. H. W. Potter and Henriette R. Klein, New York.—p. 681.
Problem Children Growing Up. L. Kanner, Baltimore.—p. 691.
Mental Changes Including Aphasia in a Patient with Sickle Cell Anemia. Beulah Bosselman and S. H. Raines, Chicago.—p. 709.

Behavior of Children Receiving Benzedrine.—To observe the effect of benzedrine on the behavior of children, Bradley selected thirty patients, already in the hospital, suffering from behavior disorders. Every child in this group had already been under observation for at least a month. In addition to routine observation and recording of behavior by ward nurses and teachers, each child was observed for three weeks by a special psychiatric nurse. During the second week of observation a daily dose of benzedrine was administered to each patient on arising. Later the records of his behavior during this week were compared with those of the week prior and the week following. The most spectacular change in behavior brought about by the use of benzedrine was the improved school performance of approximately half the children. These patients were of good intelligence and were receiving adequate attention for any personality disorders that might affect their school progress. The other children of the group did not show this striking response in school, but most of them responded in other ways to the medication. Only half of the group showing favorable mood changes shared to a notable degree in the school improvement, especially in arithmetic performance, since speed of comprehension, degree of accuracy and quantity of output were all favorably affected. It appears paradoxical that a drug known to be a stimulant should produce subdued behavior in half of the children, but it should be borne in mind that portions of the higher levels of the central nervous system have inhibition as their function and that stimulation of these portions might produce the clinical picture of reduced activity through increased voluntary control. In spite of the results obtained, it seems wise to await more complete knowledge of the action of benzedrine before recommending its clinical use in behavior problem children. The drug should be administered only by the experienced physician trained in child psychiatry.

Sodium Amytal as Substitute for Tube Feeding.—Foley and Rossignoli observed recently that sodium amytal given either intravenously or intramuscularly eliminated the necessity of tube feeding, as patients invariably took nourishment after its administration. They experimented successfully with ten patients: five had schizophrenia and two had postpartum psychosis with a schizophrenic background; one had pulmonary tuberculosis with a toxic psychosis following a first stage thoracoplasty, one was diagnosed as having psychosis with cerebral arteriosclerosis and one, an extremely active and resistive patient, was treated for dementia paralytica. In the cases in which the drug was effective, the ideal reaction was observed in the depressed catatonic reaction rather than in the active manic state, regardless of the type of psychosis dealt with. When the drug was given intravenously the patients took solids or liquids immediately after the needle was withdrawn from the vein, and the desire to eat and also talk usually lasted from ten to fifteen minutes. When injected intramuscularly, the patient began to take nourishment in from fifteen to thirty minutes afterward and the effects lasted from fifteen to thirty minutes. The optimal dose for the required action has not been satisfactorily decided. The doses employed varied from 3¼ to 7½ grains (0.25 to 0.5 Gm.) when given either intravenously or intramuscularly. The desired dose causes a semiconscious state and is determined only after one or two trials. Whether or not these ten patients might have progressed more favorably and eaten sooner following tube feeding is doubtful. However, under sodium amytal they all ate, talked, gained weight, received a well balanced diet and did not have diarrhea. They were less resistive and negativistic and also indirectly obtained needed rest and sleep.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

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Carcinoma of the Larynx: Janeway Memorial Lecture. D. Quick, New York.—p. 821.
Epidermoid (Cholesteatoma) Lying Under Scalp and Outside Pericranium: Case. N. C. Norcross, Philadelphia.—p. 854.
Excretion of Foreign Substances by Liver and Question of Visualization of Gallbladder in Presence of Jaundice. R. Ottenberg, New York.—p. 859.
Physiologic Principles in Roentgenographic Visualization of Biliary Tract After Injection of Lipiodol. H. Doubilet, New York.—p. 863.
Emptying of Normal Gallbladder. M. L. Sussman, New York.—p. 867.
Cholecystography and Its Correlation with Gallbladder Pathology. R. Colp, New York.—p. 872.
Regional Jejunitis. C. Gottlieb and S. Alpert, New York.—p. 881.
*Localized Nonspecific Ulcerative Enteritis with Some Unusual Features. R. T. Taylor, Los Angeles.—p. 884.
Chronic Adhesive Spinal Arachnoiditis: Case. C. W. Schwartz and E. M. Deery, New York.—p. 887.
Acrosclerosis Hyperplastica Intra-Ossea. N. A. Podkaminsky, Kharcow, U. S. S. R.—p. 889.
Prevention and Treatment of Roentgen Injuries of the Skin. H. Schmitz, Chicago.—p. 893.
*Effect of Gamma Radiation on Mitosis. S. Warren, Boston.—p. 899.
Effect on the Percentage Depth Intensity of Increase in Voltage, Filtration and Skin Target Distance (150-300 Kilovolts [Peak]). C. L. Randall, Buffalo.—p. 903.
Radiologic Applications of Geiger-Müller Counter. C. B. Braestrup, E. J. Murphy and M. D. Whitaker, New York.—p. 915.

Localized Nonspecific Ulcerative Enteritis.—Taylor cites two cases of localized or "regional" nonspecific ulcerative enteritis which in their initial stages seemed to correspond to those described by Chron, Ginzburg and Oppenheimer, and others, but which failed to follow the orthodox path and were not cured by surgical resection. The feature of interest in the first case is not that nonspecific ulceration was found in both the small and the large intestine but that resection in a patient with nonspecific ileocolitis resulted in only temporary cure of short duration and that this patient subsequently had generalized ulceration throughout most of the colon. Following resection of the diseased segment in the second patient the colon and portions of the lower ileum were subsequently involved completely.

Effect of Gamma Radiation on Mitosis.—Warren has determined the frequency of the various stages of cell division in Walker carcinoma No. 256 after gamma irradiation. From 15,000 to 24,000 cells were counted and the number and stages of mitoses noted. The counts were made at a magnification of 900 diameters and questionable forms were studied under higher power. Some stages of mitosis could not be classified positively, and these were placed in the unknown group. In the nonirradiated tumor, about twenty mitoses occur per thousand cells and are fairly evenly divided as to stage, except for a moderate preponderance of cells in metaphase. Within one

and a half hours of the onset of irradiation a sharp drop in the number of mitoses occurs, reaching its nadir in the time interval from one and a half to ten and a half hours later. The proportion of cells in prophase tends to rise as this drop in mitotic activity occurs and falls about twenty hours after cessation of irradiation. Since the rise of prophases is only proportionate and actually a marked decrease in number occurs, the probability is that certain mitoses do not progress to completion, owing to death of the cell or arrest of karyokinesis. Since a piling up of numerous mitoses does not occur at any one stage, since the reduction in total number occurs promptly, and since the reduction in number appears in all stages at about the same time, one may assume that the earliest steps in mitosis are inhibited, probably even before the visible changes of prophase can be noted. Appearance of abnormal mitoses (multipolar spindles, lagging chromosomes) are not helpful, since they occur not infrequently in nonirradiated tumors of this type and since there is marked variation in both their absolute and their proportionate frequency. Radon does not differ essentially from roentgen radiation in its effect on mitosis.

American Journal of Surgery, New York

38: 459-748 (Dec.) 1937. Partial Index

Emergency Treatment of Fractures of Lower Extremities. E. P. Palmer, Phoenix, Ariz.—p. 461.

Fractures of Scapula and Ribs. R. T. Findlay, New York.—p. 489.

Fractures of Upper End and Shaft of Humerus. D. Gordon, New York.—p. 495.

Fractures of Carpal Bones. L. E. Snodgrass, Philadelphia.—p. 539.

Fractures of Metacarpals, Metatarsals and Phalanges. D. L. Rider, Chicago.—p. 549.

Fractures of Sternum and Thyroid Cartilage. W. G. Stuck, San Antonio, Texas.—p. 560.

Fractures of the Spine. J. Dunlop, Pasadena, Calif.—p. 568.

Fracture Dislocations of Cervical Spine. W. G. Crutchfield, Richmond, Va.—p. 592.

Fractures of Dorsal and Lumbar Vertebrae. W. A. Rogers, Boston.—p. 599.

Nonoperative Treatment for Fracture of Neck of Femur. G. W. Leadbetter, Washington, D. C.—p. 612.

Operative Treatment of Hip Fractures: Intracapsular. F. J. Cotton, Boston.—p. 619.

Nonoperative Treatment of Fractures of Shaft of Femur. R. R. Impink and W. E. Lee, Philadelphia.—p. 629.

Operative Treatment of Fractures of Shaft of Femur. J. H. Wagner, Pittsburgh.—p. 648.

Osteochondritis Dissecans: Description of Stages of Condition and Its Probable Traumatic Etiology. F. M. Conway, New York.—p. 691.

Fractures of Tibia Involving the Knee Joint: "Bumper" or "Fender" Fractures. J. A. Dickson, Cleveland.—p. 700.

Fractures of the Ankle. F. D. Dickson, Kansas City, Mo.—p. 709.

American Review of Tuberculosis, New York

36: 711-810 (Dec.) 1937

Bronchiectasis Associated with Tuberculous Bronchial Obstruction. S. S. Cohen, Oak Terrace, Minn., and G. K. Higgins, Minneapolis.—p. 711.

Massive Pulmonary Atelectasis Following Bronchial Obstruction in Tuberculosis. S. Sanes and W. S. Smith, Buffalo.—p. 727.

Radiologic Measurements of Respiratory Motion of Pneumothorax Lung. A. L. Banyai, Wauwatosa, Wis.—p. 740.

Silicotuberculosis. D. M. Brumfiel and L. U. Gardner, Saranac Lake, N. Y.—p. 757.

Effect of Radio Short Waves on Tubercle Bacilli and Tuberculosis. H. J. Corper, M. L. Cohn, M. G. Simpson and C. Bower, Denver.—p. 763.

*Effect of Contagious Disease on Pulmonary Tuberculosis and on Tuberculin Reaction in Children. J. P. Nalbant, Northville, Mich.—p. 773.

Streptococcic Throat Infections in Tuberculous Children. Gertrude F. Mitchell, Northville, Mich.—p. 778.

Tuberculosis Work Among Negroes in Philadelphia, with Especial Reference to the Negro Bureau. H. D. Brown, Philadelphia.—p. 787.

Bacterioscopic Examination of Sterilized Sputum. Elena I. Politova, Moscow, U. S. S. R.—p. 799.

Effect of Contagious Diseases on Pulmonary Tuberculosis.—Nalbant studied 118 children convalescing from tuberculosis who acquired acute contagious diseases. No definite evidence was found in support of the prevalent belief that measles, chickenpox, whooping cough, mumps, scarlet fever and diphtheria have a deleterious effect on tuberculous lesions in the lungs of children or that the foregoing diseases depress allergy to tuberculin in a child with healed or active tuberculosis. Further data were discovered to strengthen the contention that exacerbations or remissions are fairly common occurrences during the course of the childhood type of tuberculosis and that they may occur in the presence or absence of intercurrent contagious diseases.

Anatomical Record, Philadelphia

70: 1-138 (Dec.) 1937

Relation of Sciatic Nerve and of Its Subdivisions to Piriformis Muscle. L. E. Beaton and B. J. Anson, Chicago.—p. 1.

Effects of Jarring on Embryogeny of Chick Embryos. K. A. Stiles and R. L. Watterson, Cedar Rapids, Iowa.—p. 7.

Cytologic Abnormalities in Oocytes of the Three-Week Kitten's Ovary. Mary Elizabeth Sneider, Providence, R. I.—p. 13.

Functional Homeografts of Rat Adrenal Gland Grown in Vitro. Lydia Lux, G. M. Higgins and F. C. Mann, Rochester, Minn.—p. 29.

Origin of Sympathetic Trunks in Chick Embryo. D. S. Jones, Minneapolis.—p. 45.

Rare Cardiac Anomaly. W. S. Hammond, Ithaca, N. Y.—p 67.

Effect of Fat in Simplified Diets on Reproductive Organs of Female Albino Rat During Gestation. E. C. Maeder, Minneapolis.—p. 73.

Experimentally Produced Sterile Gonads and the Problem of Origin of Germ Cells in Chick Embryo. B. H. Willier, Rochester, N. Y.—p. 89.

Studies on Reproductive System of Alligator: I. Effects of Prolonged Injections of Pituitary Whole Gland Extract in Immature Alligator. T. R. Forbes, Rochester, N. Y.—p. 113.

Archives of Dermatology and Syphilology, Chicago

37: 1-168 (Jan.) 1938

Multiple Pigmented Nevi: Study of Origin of Nevus Cell. M. H. Ebert, Chicago.—p. 1.

Epidermolysis Bullosa Dystrophica (Recessive Type): Report of Case. L. Tulipan, New York.—p. 22.

*Lichen Planus of Eyelids. H. E. Michelson and C. W. Laymon, Minneapolis.—p. 27.

Familial Multiple Lipomas: Report on Family. A. A. Humphrey and P. C. Kingsley, Battle Creek, Mich.—p. 30.

*Epilating Action of Ethyl Gasoline. H. J. Templeton, G. Michael and J. M. Key, Oakland, Calif.—p. 35.

Management of Metastatic Carcinomatous Glands in Neck. W. H. Guy and F. M. Jacob, Pittsburgh.—p. 43.

*Leukopenic Index Test in Atopic Dermatitis. E. M. Rusten, Minneapolis.—p. 52.

Measurement of Roentgen Therapy for Tinea Capitis: Correlation of Epilation Dose with the Roentgen. C. G. Lane and G. M. Crawford, Boston.—p. 62.

Stomatitis Venenata: Report of Case of Sensitivity of Mucous Membranes and Skin to Oil of Anise. A. B. Loveman, Louisville, Ky.—p. 70.

Lichen Planus of Eyelids.—Some areas of the body seem immune to the invasion of certain diseases. This appears to be true of the eyelids in lichen planus; but Michelson and Laymon saw five patients in whom the eyelids were the seat of unmistakable lesions of lichen planus. Three types of lesions of lichen planus on the eyelids were observed. 1. The classic lilac-colored slightly delled papules with filigree scaling were associated with similar lesions on the body. 2. Papules were so arranged as to make the typical annular or small medallion-like plaques which are often seen on the glans penis. Patients with this type had other annular lesions on the body. 3. Two patients had lesions of the eyelids which were unique. They were brunet women aged 29 and 32. The upper eyelids were discolored with a sepia-brown retiform eruption, which was not made up of elevated papules, although in the skein of the network were small knobs which could have been papules previously. The eruption caused no symptoms but was gradually extending to all four lids and was becoming darker, constituting a cosmetic deformity. In one of these cases a small bit of tissue was excised, and on microscopic examination it showed the characteristic bandlike infiltration of lichen planus. The rest of the skin and the mucous membranes were free from eruption in both cases. The eruption on the eyelids was identical with areas of melanotic staining seen in certain patients with lichen planus in the late stages of regression. This form of lichen planus of the eyelids could easily be ignored as a variant of that disease or might be diagnosed as erythema ab igne. Conjunctival lesions are identical with those seen on the buccal or on the genital mucosa.

Epilating Action of Ethyl Gasoline.—Templeton and his associates carried out a series of experiments which show that temporary loss of hair results when tetra-ethyl lead gasoline substance is applied to the hairy skin of experimental animals and that the animal dies if such applications are continued over a sufficient period. Although they are not certain that this phenomenon has any bearing on loss of hair in human beings, they report a case of alopecia areata (totalis) which aroused their interest in the subject. The patient worked for four days around and under an automobile, removing greases and oils from the motor and chassis by means of gasoline atomized

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through a spray gun. He ascertained later that the gasoline used was treated with tetra-ethyl lead. It was not the heavily treated variety sold at a premium. Three days after completing this job he noted sudden loss of the hair of his left eyebrow, most of the right eyebrow and the hair from about one third of his scalp. Within a month two thirds of the hair on his scalp had fallen out and by the end of ten weeks he had lost every hair on his body. From their experiments they conclude that, when gasoline containing 0.03 per cent tetra-ethyl lead and 0.02 per cent ethylene dibromide is applied to the skin of rats, guinea pigs or rabbits, loss of hair results in the areas to which the gasoline has been applied and in varying degrees lateral to the point of application. Regrowth of hair is observed in about three or four weeks and is complete in about seven weeks. If the stronger ("premium") gasoline, containing larger amounts of tetra-ethyl lead, is used for a week, approximately one fourth to one third of the animals die. Control animals treated with kerosene or plain gasoline are not affected. Further work is being done to determine which component or combination of components of the tetra-ethyl lead gasoline is responsible.

Leukopenic Index Test in Atopic Dermatitis.—Rusten applied the leukopenic index test and cutaneous tests to nineteen patients from 11 to 30 years of age and having atopic dermatitis. Of 248 foods tested, 20 per cent gave compatible curves and 10 per cent of these produced symptoms when tried clinically; 50 per cent gave indeterminate curves and 35 per cent of these caused symptoms; 30 per cent gave incompatible curves and 50 per cent of these caused pruritus or increase of eruption. The conclusion is that the leukopenic index test is of value in atopic dermatitis only so far as foods are concerned and, although food produced some symptoms in 75 per cent of the patients studied, they were rarely the sole cause of the eruption. The results of studies of the white blood cells must be interpreted as are those of other laboratory tests, with relative percentages of accuracy, dependent on many technical factors and clinical observations.

Archives of Ophthalmology, Chicago

18: 887-1064 (Dec.) 1937

Chiasmal Syndromes Produced by Lesions in Posterior Fossa. H. P. Wagener and P. L. Cusick, Rochester, Minn.—p. 887.
Muscular Anomalies and Ametropia: Practical Consideration. J. W. White, New York.—p. 892.
Lever Action Operation for Intracapsular Extraction of Cataract. K. C. Dutt, Sonpur Raj, India.—p. 897.
Effects of Dinitrophenol on Permeability of Capsule of Lens. W. E. Borley and M. L. Tainter, San Francisco.—p. 908.
Significance of Foveal Depression. G. L. Walls, Detroit.—p. 912.
Chancre of Upper Eyelid in Infant Two Months of Age: Report of Case. A. Appelbaum, New York.—p. 920.
Use of Iodized Poppy-Seed Oil in Ophthalmology. T. J. Dimitry, New Orleans.—p. 926.
Case of Mixed Tumor of Lacrimal Gland, with Retinal Folds and Choroidal Detachment, Which Disappeared After Removal of Growth. J. Ziporkes, New York.—p. 933.
Eugenic Significance of Retinitis Pigmentosa. W. Allan, Charlotte, N. C.—p. 938.
*Importance of Diet in Etiology and Treatment of Tobacco-Alcohol Amblyopia. F. D. Carroll, New York.—p. 948.
Intra-Ocular Invasion by Larva of Ascaris: Report of Case with Unusual Complications. F. P. Calhoun, Atlanta, Ga.—p. 963.
Neurogenic Origin of Choroidal Sarcoma. Georgiana Dvorak-Theobald, Oak Park, Ill.—p. 971.
Surgical Treatment of Strabismus: Review of Recent Literature. M. C. Wheeler, New York.—p. 1000.

Diet in Treatment of Tobacco-Alcohol Amblyopia.—Carroll informed eight patients, who had tobacco-alcohol amblyopia, of the nature of their disease, of the usual treatment for this type of amblyopia and of the fact that on certain conditions they could enter the hospital without charge to them. The conditions were (1) that they should continue to smoke and drink as much as they had while contracting the disease and (2) that they must eat what was given them. The patients have been observed for at least one year. One of the eight patients did not improve. She had atrophy of the papillomacular bundle of the optic nerve, and vision remained stationary. All the other patients showed very satisfactory results and all have vision for reading. The speed of recovery seemed to be at least as good in these patients as in patients previously studied who abstained from tobacco and alcohol. The diet that the patients were given was high in vitamin B, well balanced, adequate in all respects and supplemented by powdered brewers' yeast in doses of two tablespoonfuls five times daily; vegex (a brewers' yeast extract) in doses of one teaspoonful three times daily and wheat germ (Embo) in doses of four tablespoonfuls three times daily. They were also given liver extract intramuscularly in doses of 5 cc. several times weekly and cod liver oil in doses of 1 ounce (30 cc.) daily. The author concludes that tobacco-alcohol amblyopia is perhaps not the result of a deficiency state but that diet does play an important part.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

18: 737-800 (Dec.) 1937

Short Wave Treatment of Endocrine System, Diencephalon and Mesencephalon. J. Samuels, Amsterdam, Netherlands.—p. 741.
Effect of Ultraviolet and Visible Rays on Carbohydrate Metabolism. L. Pincussen, Chicago.—p. 750.
*Ultraviolet Irradiation in Secondary Anemia. R. Kovács, New York.—p. 756.
Relation of the Council on Medical Education and Hospitals to Standardization of Schools for Physical Therapy Technicians. O. N. Andersen, Chicago.—p. 764.
X-Ray Treatment of Inflammations. A. F. Tyler, Omaha.—p. 766.
Ultraviolet Irradiation of Erysipelas in Infants. S. Starr, Brooklyn.—p. 772.

Ultraviolet Irradiation in Secondary Anemia.—Kovács carried out a controlled experimental investigation of the effects of a definite dose of ultraviolet irradiation on 113 hospitalized patients with secondary anemia. All the patients including the controls were on the same diet. The controls did not receive treatment of any kind during the two weeks devoted to the tests nor did the patients receive any medication that would tend to activate the hemopoietic organs. Attention was concentrated to that part of the blood picture which involved the hemoglobin, the red cells and the white cells. Ultraviolet from the quartz mercury high pressure arc lamp accelerated the production of hemoglobin. The rate of acceleration appeared to be greater if the complete spectrum was used. Acceleration was not so great when only the longer ultraviolet through a Corex D filter was employed. Ultraviolet radiation increased the number of red cells and the increase appeared to be independent of the portion of the ultraviolet spectrum used. Ultraviolet radiation increased the number of white cells, but individual results varied so greatly within the groups that final conclusions must be reserved until after further experimentation. The effects on the blood picture as well as on the general condition indicate that ultraviolet irradiation is an aid in the treatment of secondary anemia.

Canadian Public Health Journal, Toronto

28: 575-626 (Dec.) 1937

Survey of Incidence of Venereal Diseases in Toronto in 1937. G. Bates, Toronto.—p. 575.
Lead and Arsenic Content of Canadian Domestic Tobaccos. F. A. J. Zeidler and W. J. Wagner, Toronto.—p. 582.
Sexual Sterilization in Alberta: Eight Years' Experience, 1929 to May 31, 1937. R. R. MacLean, Ponoka, Alta., and E. J. Kibblewhite, Edmonton, Alta.—p. 587.
Prenatal Nursing Supervision. Esther M. Beith, Montreal.—p. 591.
Puerperal Sepsis and Its Prevention. R. Hare, Toronto.—p. 596.

Indiana State Medical Assn. Journal, Indianapolis

30: 617-674 (Dec.) 1937

Fluid Balance and Dehydration in Prevention and Control of Eclampsia. J. O. Arnold, Philadelphia.—p. 617.
Polypoid Disease of the Colon. L. A. Buie, Rochester, Minn.—p. 622.
Treatment of Colles Fractures. G. J. Garceau, Indianapolis.—p. 627.
Common Neoplasms of the Skin. H. J. Pierce, Terre Haute.—p. 631.
Acute Retrobulbar Neuritis. C. W. Rutherford, Indianapolis.—p. 634.
Three Year Study of Student Nurses, 1935-1937. Mary A. Meyers, Indianapolis.—p. 638.

Iowa State Medical Society Journal, Des Moines

27: 609-672 (Dec.) 1937

Brucellosis. L. R. Woodward, Mason City.—p. 609.
Fracture Demonstration. W. Scott, Sioux City.—p. 614.
Internal Fixation for Fractures of Femoral Neck. C. J. Lohmann, Burlington.—p. 616.
Lesions of the Esophagus. A. M. Gordon, Des Moines.—p. 621.
X-Ray Becomes an Adjunct to Otolaryngologic Therapy. L. G. Howard, Council Bluffs.—p. 625.
The Bursitides of the Foot. J. Wolf, Davenport.—p. 632.

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Johns Hopkins Hospital Bulletin, Baltimore

61: 371-434 (Dec.) 1937

Paroxysmal Hypertension and Other Clinical Manifestations Associated with Benign Chromaffin Cell Tumors (Pheochromocytomas). J. E. Howard and W. H. Barker, Baltimore.—p. 371.

Primary Carcinoma of Trachea with Cutaneous Carcinomatosis. E. L. Keeney, Baltimore.—p. 411.

Congenital Cardiac Malformation Presenting Complete Interruption of Isthmus Aortae with Transposition of Great Arteries. L. P. Hamburger Jr., Baltimore.—p. 421.

Journal of Bacteriology, Baltimore

34: 567-674 (Dec.) 1937

Growth and Respiration of Some Soil Bacteria in Juices of Leguminous and Nonleguminous Plants. D. W. Thorne and P. E. Brown, Ames, Iowa.—p. 567.

Apparatus for Measuring Turbidity of Bacterial Suspensions. Elizabeth V. Wright and H. Kersten, Cincinnati.—p. 581.

Relation of Peptone to Production of Hemolysin by Streptococci. F. Smith, Montreal.—p. 585.

Influence of Various Substances and Conditions on Streptococcic Hemolysin. F. Smith, Montreal.—p. 603.

Classification of Acid-Fast Bacteria. Ruth E. Gordon, New York.—p. 617.

Identity of "Bacillus Innutritus" (Klein-Schmidt) and Bacillus Paraputrificus (Bienstock). I. C. Hall and Dorothy Ridgway, Denver.—p. 631.

Effect of Soft X-Ray Irradiation on Bacteriophages. Elizabeth V. Wright and H. Kersten, Cincinnati.—p. 639.

*Differential Medium for Meningococcus and Gonococcus. Sadie F. Bailey, Pittsburgh.—p. 645.

Differential Medium for Meningococcus and Gonococcus.—Bailey describes a medium consisting of whole serum from which the fermentable substances and diastase have been removed and to which have been added a concentrated broth containing inorganic salts and a carbohydrate and indicator. Differential identification between meningococci and gonococci can usually be established in from twelve to twenty-four hours.

Journal of Experimental Medicine, New York

66: 653-826 (Dec.) 1937

Epizootic Disease of Ferrets Caused by Filtrable Virus. C. A. Slanetz and H. Smetana, New York.—p. 653.

Comparative Effects of Neutrons and X-Rays on the Whole Body. J. H. Lawrence, Berkeley, Calif., and R. Tennant, New Haven, Conn.—p. 667.

*Studies on Immunity in Type of Human Allergy (Hay Fever): Serologic Response of Nonsensitive Individuals to Pollen Injections. R. A. Cooke, Mary Loveless and A. Stull, New York.—p. 689.

Calcium Content of the Kidney as Related to Parathyroid Function. W. Donohue, C. Spingarn and A. M. Pappenheimer, with assistance of Nancy Downes, New York.—p. 697.

Effect of Increased Antipneumococcic Immunity on Inception of Experimental Lobar Pneumonia in Dog. O. H. Robertson, Chicago.—p. 705.

Spotted Fever: III. Identification of Dermacentroxenus Rickettsi and Its Differentiation from Nonpathogenic Rickettsiae in Ticks. H. Pinkerton and G. M. Hass, Boston.—p. 729.

Experimental Local Bladder Edema Causing Urine Reflux into Ureter and Kidney. J. Auer and L. D. Seager, St. Louis.—p. 741.

Unilateral Inhibition of Renal Shwartzman Phenomenon Following Injection of Bacterial Filtrate into Renal Artery. A. R. Moritz and D. Weir, Cleveland.—p. 755.

Experimental Study of Protective Inoculation with Heat Killed Tubercle Bacilli. E. L. Opie and J. Freund, New York.—p. 761.

Studies on Haemophilus Influenzae: II. Comparative Study of Virulence of Smooth, Rough and Respiratory Strains of Haemophilus Influenzae as Determined by Infection of Mice with Mucin Suspensions of Organism. Caroline A. Chandler, L. D. Fothergill and J. H. Dingle, Boston.—p. 789.

Prothrombin Deficiency and Bleeding Tendency in Liver Injury (Chloroform Intoxication). H. P. Smith, E. D. Warner and K. M. Brinkhous, Iowa City.—p. 801.

Immunity in Type of Human Allergy (Hay Fever).—Cooke and his co-workers found that large injections of ragweed pollen extract into normal nonsensitive volunteers did not produce a sensitization to ragweed. A group of volunteers in whose skin many reactions were induced by injections of ragweed extract mixed with ragweed sensitive serum failed to show any serologic changes. The theory that the immune substance found in the serum of treated ragweed sensitive cases was due to the reaction or to some substance created by it and not to the ragweed alone was not upheld. On the contrary in another group of volunteers who received larger amounts of ragweed but no sensitive serum, serologic changes were induced resembling those previously observed to occur in ragweed sensitive patients after treatment. They were demonstrable by an inhibition of the immediate reaction and by interference with the neutralization of sensitive serum by its antigen. These serologic changes are therefore independent of the specific reaction characteristic of this type of allergy. The inhibiting factor was found to be related to the pseudoglobulin fraction of the serum and was shown to be specific.

Journal of Lab. and Clinical Medicine, St. Louis

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Thyroid Gland and Hematopoiesis: II. Effect of Thyroid Extract, Liver Extract and Iron on Anemia of Myxedema. J. C. Sharpe and J. D. Bisgard, Omaha.—p. 219.

Hyperinsulinism: Report of Second Case with Anatomic Findings. E. Ziskind and W. A. Bayley, Los Angeles.—p. 231.

Control of Intractable Clinical and of Total Experimental Diabetes with Protamine Insulin. W. H. Nadler and Bertha L. Isaacs, Chicago.—p. 241.

Meningococcus Antitoxin: Laboratory and Therapeutic Status. N. S. Ferry, Detroit.—p. 252.

Effect of Atropine on Gastric Contents of Man: Statistical Report of 170 Cases. S. L. Immerman, Philadelphia.—p. 256.

Observations on Induced Encystment of Endamoeba Histolytica in Vitro. H. Tsuchiya, St. Louis.—p. 261.

Modification of Krasnogorski Method for Stimulating and Measuring Secretion from Parotid Glands in Human Beings. J. E. Finesinger and Grace Lubin Finesinger, Boston.—p. 267.

Determination of Total Fixed Base in Tissue. Cornelia T. Snell and I. N. Kugelmass, New York.—p. 274.

New Method of Staining Spirochetes and Bacteria in Smears. G. Steiner, New Orleans.—p. 293.

Advantage of Stained Antigens in Diagnostic Agglutination Test for Brucella Infections. R. D. Minster, Boise, Idaho.—p. 298.

Improved Technic for Biliary Drainage. F. C. Forsbeck, Lansing, Mich.—p. 310.

Simple Method for Demonstration of Spirochetes in Frozen Sections. G. Steiner, Detroit.—p. 315.

Analysis of Renal Calculi. J. Kamlet, Brooklyn.—p. 321.

Medical Bull. of Veterans' Adm., Washington, D. C.

14: 207-300 (Jan.) 1938

Interpretation of Roentgenograms of Cardiac Contours and Measurements. L. M. Maguire.—p. 207.

Treatment of Hay Fever and Ivy Poisoning by Local Desensitization with Sodium Oleate and Salts of Other Unsaturated Fatty Acids. E. W. Lazell.—p. 216.

Protamine Zinc Insulin in Treatment of Diabetes. H. Freed.—p. 220.

*Vitamin Deficiency as an Etiologic Factor in Central Neuritis. D. J. Sullivan and A. Simon.—p. 228.

*Hypoglycemia as Cause of Seizures in General Paralysis. L. Birnbaum and J. A. Wood.—p. 236.

Spermatogenic Function. C. D. Allen.—p. 241.

Cardiovascular Pain. C. R. Brooke.—p. 247.

Diagnosis of Personality on Psychodynamic Basis. C. H. Hecker.—p. 253.

Management of Unilateral Calculus Obstruction. S. R. Coleman.—p. 260.

Polyneuritis: Study of Certain Types. J. B. DesRochers.—p. 262.

Mental Changes in Intracranial Neoplasms. F. J. Imburgia.—p. 267.

Alveolectomy Prosthesis. J. Mitchell.—p. 270.

Vitamin Deficiency as Factor in Central Neuritis.—The picture of central neuritis described by Meyer is a terminal state, and Sullivan and Simon believe it to be the result of prolonged avitaminosis, particularly a vitamin B_1 deficiency. No abnormalities are found grossly in the brain. The microscopic changes involve the ganglionic cells of the brain and spinal cord. This is characterized by a central chromatolysis, lateral displacement of the nucleus and swelling of the cell body. These changes are most marked in the large and medium size pyramidal cells of the cortex, the oculomotor nucleus, the nucleus ambiguus, the ventral horn motor cells and perhaps the lateral horn cells. The neuropathology is of a degenerative type, so that the term "central neuritis," which suggests an inflammation, is a misnomer. "Central neuritis" occurs in a variety of conditions, such as Korsakoff's psychosis, pellagra, alcoholic polyneuritis, alcoholic encephalopathy, polyneuritis of pregnancy and acrodynia. Toxins and infections are not the primary etiologic factor in the causation of this syndrome. Vitamin deficiency is the important etiologic basis for this disorder, and apparently vitamin B_1 is the essential one. A high vitamin diet with administration particularly of vitamin B_1 (antineuritic) is therapeutically indicated. Three cases with clinicopathologic data are presented.

Hypoglycemia as Cause of Seizures in Dementia Paralytica.—Birnbaum and Wood studied the sugar tolerance curves of nine paretic patients who had seizures. Abnormal curves and sharp drops in hypoglycemic levels were observed in all cases. The average difference between the highest and lowest sugar levels of these patients was much greater than

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that of the controls. Three patients had symptoms of seizures while their blood sugar was at hypoglycemic levels; these symptoms cleared as the level of the blood sugar rose. Therapy was attempted with one patient whose frequent seizures made him a suitable subject. A high fat, low carbohydrate diet (ketogenic) resulted in an increased number of seizures. Intramuscular injections of anterior pituitary extract in various doses (while on a normal diet) caused a reduction in the number of seizures from an average of thirty seizures weekly to an average of fifteen seizures weekly. A 25 per cent solution of dextrose given intravenously in a dose of 40 cc. resulted in immediate cessation of seizures in a patient who was having a series of seizures. The seizures did have some relation to altered sugar metabolism in these patients.

Medicine, Baltimore

16: 351-492 (Dec.) 1937

Pneumothorax Treatment of Pulmonary Tuberculosis. E. H. Rubin, New York.—p. 351.

New England Journal of Medicine, Boston

217: 899-932 (Dec. 2) 1937

Major Injuries to the Spine. W. J. Mixter, Boston.—p. 899.
Industrial Insurance Aspect of Traumatic Surgery. J. H. Shortell, Boston.—p. 904.
*Treatment of Burns with Compound of Aniline Dyes. R. H. Aldrich, Boston.—p. 911.
Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinuria: Study of Mechanism of Hemolysis in Relation to Acid-Base Equilibrium. T. H. Ham, Boston.—p. 915.

Treatment of Burns with Compound of Aniline Dyes.—Aldrich maintains that there is no assurance that mere spraying with aniline dyes will prevent mortality from burns. Their use makes treatment easier, but in the combating of the shock, in the constant attention paid to the eschar and in the nursing care and the diet, great efforts are necessary. In patients with extremely severe burns, blood transfusions should be used frequently to help combat infection and to give the patient added powers of healing. While the new combination of dyes is as superior to gentian violet as gentian violet is to tannic acid, it is not the final answer to all the problems presented by a burned patient. A burn should be rightly considered as an infected surgical lesion and that infection rather than absorption of a split protein causes death; for where there is no infection there is no toxemia.

Oklahoma State Medical Assn. Journal, McAlester

30: 425-466 (Dec.) 1937

Food Allergy: Value of Leukopenic Index in Food Sensitive Patients. R. M. Balyeat, Oklahoma City.—p. 425.
Intestinal Obstruction. F. Christopher, Evanston, Ill.—p. 431.
Experience with Use of Protamine Insulin: Preliminary Report. B. F. Keltz, Oklahoma City.—p. 438.
Diabetes and Heart Disease. E. R. Musick, Oklahoma City.—p. 441.
*Anemia in General Practice. H. K. Speed Jr., Sayre.—p. 443.

Anemia in General Practice.—Speed says that the most common types of anemia seen by the average practitioner are anemia of pregnancy, anemia associated with sepsis, dental sepsis and endocervicitis, anemia due to dietary deficiencies and anemia of infancy. The treatment of anemia may be divided into three divisions: prevention, the general treatment of anemia and treatment by specific remedies. The field of prevention is rapidly becoming more extensive and is of especial value in anemia of pregnancy and in anemia of infancy, in those due to diet deficiency as well as those due to hemorrhage. General treatment includes bed rest, high caloric and high protein diets, avoidance and removal of the infections, transfusions, and the like. Transfusions are useful in the anemias due to acute hemorrhage and many other conditions in which the cause may not be known, or if there is no specific treatment, such as in carcinoma, leukemia and aplastic anemia. They may also be used to great advantage in severe anemia even when specific treatment is used or when response is slow. In the specific treatment of the macrocytic type of anemia, the intrinsic factor as supplied by liver or desiccated hog stomach is of value particularly in pernicious anemia or pernicious anemia of pregnancy, and temporarily so when either the formation of the intrinsic factor in the stomach or its storage in the liver is interfered with, as in carcinoma and cirrhosis.

Public Health Reports, Washington, D. C.

52: 1693-1752 (Nov. 26) 1937

Immunizing Properties of Formolized Rocky Mountain Spotted Fever Rickettsiae Cultivated in Modified Maitland Mediums. Ida A. Bengtson.—p. 1696.
Methods for Determination of Quartz in Industrial Dusts. F. H. Goldman.—p. 1702.
Study of Dust Control Methods in Asbestos Fabricating Plant. R. T. Page and J. J. Bloomfield.—p. 1713.

52: 1753-1804 (Dec. 3) 1937

The Increase in Average Length of Life. H. F. Dorn.—p. 1753.
An Approach to a Rural Mental Health Problem. J. A. Jackson.—p. 1777.
Health Supervision by Nurses in a Bicounty Health Department: Brunswick-Greensville Health Administration Studies No. IX. Rosalie I. Peterson.—p. 1783.

52: 1805-1850 (Dec. 10) 1937

Seasonal Variation in Intensity of Brain Reaction of the St. Louis Encephalitis in Mice and of Endemic Typhus in Guinea Pigs. R. D. Lillie, R. E. Dyer, C. Armstrong and J. G. Pasternack.—p. 1805.

Radiology, Syracuse, N. Y.

29: 651-778 (Dec.) 1937

Development of Postgraduate Teaching in Radiology. G. W. Holmes, Boston.—p. 652.
Colloidal Thorium in Localization of Disease: Further Experimental Data in Bone Trauma and Infection. R. Pomeranz, Newark, N. J.—p. 660.
Measurement of Roentgen-Ray Dosage by Determining Effect of Radiation on Chromosomes. A. Marshak and J. C. Hudson, Boston.—p. 669.
Benzedrine Sulfate: Its Effects on Motor Function of Digestive Tract, on Gastric Acidity and on Evacuation of Biliary System. Opie Norris Smith and G. W. Chamberlin, Philadelphia.—p. 676.
Effect of Lard Oil, Sesame Oil, Acacia, Retene and 1:2:5:6 Dibenzanthracene on Certain Organs and a Transplantable Rat Sarcoma in Animals of Pure Breed. J. A. Pollia, Los Angeles.—p. 683.
*Blood Vessel Markings in Dorsal Vertebrae Simulating Fracture: Preliminary Report. K. S. Davis, Los Angeles.—p. 695.
The Neck: Roentgenologic Study. S. Brown, J. E. McCarthy and H. G. Reineke, Cincinnati.—p. 701.

Markings in Dorsal Vertebrae Simulating Fracture.—Davis describes an anomaly of the dorsal vertebrae which has been at least once interpreted as fracture and as such was the basis of litigation. Roentgenograms showed definite transverse linear marks through the centers of the bodies of the ninth and tenth dorsal vertebrae, best seen in the lateral view but also demonstrable in the anteroposterior view. These lines apparently divided the body into two symmetrical halves, and in one of the roentgenograms the upper half of the body of the tenth dorsal apparently lay about 3 mm. anterior to the lower half. There was also a fracture through the anterior superior margin of the twelfth dorsal vertebra with a moderate compression of the anterior margin of the body as a result. A careful review of the lateral roentgenograms of the dorsal vertebrae in the author's files showed forty-three cases in which this anomaly existed. Since then, in viewing lateral films in this region, Davis has observed this transverse linear mark in about 10 per cent of all cases. It was seen in approximately the same percentage of nontraumatic cases as in those in which trauma had been sustained. Lateral roentgenograms of the removed spines of cadavers showed an astonishingly high percentage of transverse linear marks in the dorsal vertebrae (approximately 22 per cent). The vertebrae showing these marks were then carefully dissected out and the blood vessels were injected with a mixture of barium and water. After injecting the blood vessels and taking anteroposterior, lateral and longitudinal roentgenograms, Davis sectioned the vertebrae, some transversely, some anteroposteriorly and some longitudinally. These experiments revealed that the transverse linear marks were due to blood vessel channels in almost all instances. The injected channels were always found to enter the vertebral body in about the center of the posterior vertebral body wall, extending anteriorly into the body for varying distances. In no instance was the author able to trace the channel through the anterior surface of the vertebral body, although in some of the vertebrae the channel extended completely across the body. Nor was he able to demonstrate blood vessels or blood vessel channels entering the body directly on the anterior surface except for an occasional small anomalous vessel.

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An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Physical Medicine, London

12: 139-166 (Nov.) 1937

The History of Physical Medicine. H. Rolleston.—p. 140.
The Physics of Short Waves. P. Bauwens.—p. 145.
Some Clinical Applications of Short Wave Therapy. F. H. Humphris. —p. 147.
Electrotherapy Papers: V. The Constant Galvanic Current. A. P. Cawadias.—p. 149.
Electromedical Apparatus—Its Character, Operation and Care: V. Rotating Electrical Machines. L. G. H. Sarsfield.—p. 153.
*Physical Treatment in Brucellosis. L. Feldmann.—p. 157.

Physical Treatment in Brucellosis.—Feldmann made use of diathermy, x-rays and ultraviolet radiation in the treatment of brucellosis or undulant fever. Out of sixty-eight patients with brucellosis, forty-eight were treated with general diathermy. In nine cases the improvement was considerable, in thirty-two it was moderate and in seven no change occurred. The forty-one cases showing improvement were of the "reactive" form of brucellosis. The results were not so good in the thirty-two cases in which there were widespread cellulitis, periarthritis and para-arthritis, some enlargement of the lymphatic glands, changes in blood, pronounced disorder of meningocerebral character, and the like. Still, despite the presence of anatomic changes in different organs and systems there was a certain amount of improvement. Finally the seven cases not showing any improvement were those in which lesions of the central nervous system and the visceral organs were unaffected by the general diathermy. Of the eleven cases treated by x-rays, marked improvement was noted in six and "no change" in five. The best results were obtained in cases showing enlarged lymphatic glands. Improvement was noted in four of the nine cases treated with ultraviolet radiation. Only repeated and periodic treatment can form the foundation of correct treatment in this little known disease, in which physical therapy together with specific means must play a prominent part.

Irish Journal of Medical Science, Dublin

No. 143: 655-702 (Nov.) 1937

The History of Therapeutics. R. H. Micks.—p. 655.
Neurologic Therapeutics. M. Critchley.—p. 663.
Backward Displacements of the Uterus. J. S. Quin.—p. 669.
Diabetes. J. Lewis.—p. 677.

Journal of Physiology, London

91: 101-232 (Nov. 26) 1937

Effects of Tetra-Ethylammonium Iodide on Electrical Response and Accommodation of Nerve. S. L. Cowan and W. G. Walter.—p. 101.
Excitation and Inhibition in Off Effect of Retina. R. Granit and P. O. Therman.—p. 127.
Origin and Limits of Specific Dynamic Action of Intravenous Glucose. M. Wierzuchowski.—p. 140.
Relation Between Mechanical and Electrical Activity of Molluscan Unstriated Muscle. C. M. Fletcher.—p. 172.
Cerebrospinal Fluid Pressure of Man in Erect Posture. E. A. Carmichael, J. Doupe and D. J. Williams.—p. 186.
Pituitary Gland and Control of Urinary Secretion. E. C. Dodds, R. L. Noble and P. C. Williams.—p. 202.
Local Action of Eserine on Central Nervous System. F. R. Miller.—p. 212.
Secretion of Urine in Man During Experimental Salt Deficiency. R. A. McCance and E. M. Widdowson.—p. 222.

Lancet, London

2: 1233-1290 (Nov. 27) 1937

Huxley: The Brain and the Mind. E. D. Adrian.—p. 1233.
Treatment of 106 Cases of Puerperal Fever by Sulfanilamide (Streptocide). L. Colebrook and A. W. Purdie.—p. 1237.
*Treatment of Cerebrospinal Meningitis by Continuous Spinal Drainage. C. G. K. Thompson.—p. 1242.
Sarcoma of Uterus. R. S. Handley and J. Howkins.—p. 1246.
Continuous Duodenal Aspiration in Paralytic Ileus and Intestinal Obstruction: An Improved Technic. F. M. Heggs.—p. 1250.

Treatment of Meningitis by Spinal Drainage.—Thompson describes a method of treating cerebrospinal meningitis in which the cerebrospinal fluid is continuously drained from the lumbar theca through a special self-retaining screw cannula into a graduated reservoir. The results of treatment in twenty-eight cases are given and are thought to be sufficiently encouraging to indicate that in hospital practice this may be the method of choice in adult cases. The cannula is of the screw pattern with a large pitch left-hand thread, enabling it to be screwed into the interspinous ligaments and making it self retaining at least for several days. A sponge rubber pad was found to give adequate protection to the cannula in the event of the patient rolling over. Rubber tubing connects the cannula to a glass manometer and reservoir. A special stand for holding the reservoir is attached to the bed and allows variation in the manometer height. In practice the lowest point of the manometer is kept at the level of the patient's sagittal suture. If normal pressure is not maintained, symptoms of collapse make their appearance. A diagnostic lumbar puncture is first performed to record the thecal distance. Not more than 10 cc. of cerebrospinal fluid is withdrawn, because excessive reduction of intrathecal pressure makes it difficult to establish drainage later. The thecal distance having been ascertained, a cannula is selected with 0.5 cm. excess length. The tip of the cannula and that of the trocar is dipped in sterile liquid petrolatum, the fingerpiece is turned to the left, and the butt of the cannula is covered with a piece of gauze to ensure a good grip. The fourth lumbar space has been found to be the most convenient. When the first thread of the screw reaches the skin, the screwing action to the left is begun, just enough pressure being applied to take the back thrust off the spinal ligaments. When the theca is entered, two pieces of elastic plaster are applied in the form of a cross as close to the cannula as possible, to reinforce the skin against injury by the cannula and to prevent local sepsis. The sponge rubber pad is applied and fixed centrally. The manometer and reservoir are adjusted 10 inches above the patient's head, they are joined to the connecting tubing and the trocar tap is turned on. It is not advisable to insert the drainage tap until the pressure of the cerebrospinal fluid has been reduced to 100 mm. Leaving the trocar in position allows a gradual reduction of pressure. The fluid may take ten minutes or so to reach the manometer so that the excess fluid can drain away. When the flow ceases, the manometer can be lowered in stages until the final position allows for 100 mm. of intrathecal pressure. The tubing can now be clamped and the trocar replaced by the drainage tap. The advantages of continuous spinal drainage over intermittent puncture with intrathecal serum are: It is based on physiologic principles. It provides a constant index of progress of the local condition, with complete control of the intrathecal pressure and also a continuous escape for the meningeal exudate. The necessity for intrathecal serum is removed. Repeated lumbar and cisternal punctures with their attendant traumatic and anesthetic risks are avoided. Spinal and basal blocks do not occur. There is rapid relief of symptoms and return to consciousness. The disadvantages include a complicated technic with costly apparatus, special nursing while drainage lasts, increased nursing difficulties through the restricted movement of the patient and technical risks such as damage to nerve fiber, blocking and/or bending of the cannula by a violent patient.

Medical Journal of Australia, Sydney

2: 939-978 (Nov. 27) 1937

Medical Treatment of Pneumonia. J. G. Sleeman.—p. 939.
Surgical Complications of Pneumonia. D. G. McKay.—p. 944.
Medical Treatment of Uncomplicated Peptic Ulcer. O. A. A. Diethelm. —p. 948.
Treatment of Peptic Ulcer. H. Devine.—p. 952.
Strategic Points in Lumbar and Sacral Outflows of Autonomic Nervous System: Sympathetic Denervation of Lower Limbs. H. C. Trumble. —p. 958.

South African Medical Journal, Cape Town

11: 791-826 (Nov. 27) 1937

Some Aspects of Diagnosis of Pulmonary Tuberculosis. A. Bloom.—p. 793.
Tuberculosis in the Union: Policy of the Department of Public Health. E. Thornton.—p. 795.
Control and Prevention of Tuberculosis in South Africa. S. S. Hewitt. —p. 797.
Outline of General Treatment of Tuberculosis. D. P. Marais.—p. 801.
Clinical Pathology of Pulmonary Tuberculosis. P. Allan.—p. 805.
Tuberculous Peritonitis in Natives: Note. J. A. Macfadyen and W. H. Horne.—p. 810.
Abscess of the Lung. T. Schrire.—p. 812.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

53: 1539-1640 (Dec. 20) 1937. Partial Index

*Intoxication by Methyl Bromide. M. Duvoir, R. Fabre and F. Layani.—p. 1540.

Rheumatismal Adenitis and Presence of "Streptococcus Viridans" in Hypertrophic and Injured Lymph Node in Course of Infective Endocarditis. R. Debré, S. Thieffry and G. Moret.—p. 1554.

*Clinical and Therapeutic Remarks on Acute Articular Rheumatism. C. Lian and J. Facquet.—p. 1564.

Rheumatic Manifestations Elicited in Tuberculous Patient by Collapse Therapy. H. Bénard, F.-P. Merklen and M. Cord.—p. 1576.

Development and Prognosis of Rheumatic Disease (Disease of Bouillaud-Infective Endocarditis) During Childhood. H. Grenet.—p. 1586.

*Meynet's Nodes and Streptococcus Viridans. B. Le Bourdellès.—p. 1593.

Intoxication with Methyl Bromide.—Duvoir and his associates discuss the chemical nature and the physical characteristics of methyl bromide and point out that it is widely used in fire extinguishers, probably because it apparently has only a mild toxicity and for this reason seems preferable to the rather dangerous carbon tetrachloride. The authors describe five cases of intoxication with methyl bromide, two of which (one grave and one mild) they observed. The first patient, a man, aged 48, had severe headache, anorexia, profuse vomiting and vertigo following the accidental inhalation of vapors of methyl bromide. Later there were sensory and motor disturbances, progressive aphasia, amblyopia followed by amaurosis, a vertiginous condition with motor incoordination, brachial monoplegia and prostration with somnolence. The nervous syndrome lasted fifteen days, and then followed slow regression. Finally complete cure was obtained. The authors' second patient was a young man who, about three hours after the accidental inhalation of methyl bromide, presented an epileptiform syndrome, which persisted for three or four days but which disappeared without sequels. The third and fourth cases had a fatal outcome. Necropsy revealed intense congestion of the internal organs, particularly the lungs. In both these cases severe epileptic attacks followed the inhalation of vapors of methyl bromide. The fifth patient had severe headaches, attacks of vomiting, a feeling of intoxication and symptoms of toxic amblyopia. The latter case was the mildest of the five, all of which occurred in workers employed in the manufacture of fire extinguishers. In studies on rabbits the authors found that it is possible to reproduce in animals the symptoms that develop in human subjects following intoxication with methyl bromide.

Acute Articular Rheumatism.—Lian and Facquet first discuss the mode of onset of acute articular rheumatism and state that in several cases they observed that the disorder developed after a subcutaneous suppuration or after tonsillar phlegmons. They cite a case in which an attack of acute articular rheumatism was elicited by a subcutaneous abscess, another by an abscess on the thigh, another by panaritium and finally one in the course of a furunculosis. The authors point out that this case permits two interpretations in that its development is in harmony (1) with the theory which considers acute articular rheumatism an allergic result of infectious or toxic processes and (2) with the theory which regards acute articular rheumatism as a specific infectious disease. Further they cite five observations in which a tonsillar phlegmon preceded the articular manifestations. They report these cases as curiosities which are subject to discussion, for it may be suggested also that the tonsillar phlegmon is simply the result of an infection superimposed on a rheumatic angina. The chronological relationship between the articular manifestations and the cardiac localizations varies considerably. The authors found that cardiac symptoms occasionally preceded the articular manifestations by several days. Moreover, they cite the case of a boy in whom a mitral insufficiency was observed in the course of a general examination and six months later a typical rheumatic crisis developed. Such a case indicates that a rheumatic valvular cardiopathy may have an insidious onset. Discussing the diagnosis of acute articular rheumatism, the authors give especial attention to the fibrinogen content of the blood. They point out that hyperfibrinemia as a characteristic of articular rheumatism was first mentioned by Hayem and that subsequently it was investigated by several others and by themselves. To be sure, they admit that the diagnostic value of hyperfibrinemia is restricted by the fact that the same high values may occur also in certain cases of gonococcic arthritis. Nevertheless, hyperfibrinemia is highly suggestive of acute articular rheumatism. Considering the diagnostic value of electrocardiography, the authors stress the significance of the prolongation of the PR interval. The therapeutic test with sodium salicylate has only a restricted diagnostic value, for the fever as well as the arthritic symptoms often subsides under the influence of rest in bed; on the other hand, the therapeutic effect of sodium salicylate extends beyond the sphere of infective endocarditis. Following remarks about the evolution of rheumatic cardiopathies, the authors discuss the treatment. They are in accord with the majority of investigators in recognizing the value of sodium salicylate in the treatment of acute articular rheumatism. However, although it influences the pains and the fever its prophylactic and therapeutic influence on the cardiac complications is slight. In the acute and grave cases of infective endocarditis the authors add to the oral administration of sodium salicylate (about 10 Gm.) the intravenous injection of the substance (from 1 to 4 Gm.). The intravenous mode of application may cause slight ocular complications, but these are no contraindication to the method. After citing therapeutic measures that have been suggested by others, the authors conclude that at present sodium salicylate is the best medicament for acute articular rheumatism.

Meynet's Nodes and Streptococcus Viridans.—Le Bourdellès cites the history of a young soldier who had a rheumatic polyarthritis, which was favorably influenced by treatment with salicylate. The disorder was accompanied by chorea and by mental disturbances. About a year later there was a recurrence with arthralgia, erythema, valvular endocarditis and pleurisy, and numerous nodes of Meynet's type developed on the scalp and on the right forearm. Two small fragments of these nodes were subjected to bacteriologic examination with different mediums. Both yielded Streptococcus viridans in pure culture.

Presse Médicale, Paris

45: 1795-1818 (Dec. 15) 1937

Apnea and Ether Anesthesia. J. Berger and Geneviève Delahaye.—p. 1795.

*Experimental Peripancreatic Sympathectomies: Contribution to Curative Surgery of Diabetic Condition. M. Sendrail, M. Cahuzac and A. Garipuy.—p. 1797.

*Meningitis with Friedländer's Pneumonia Bacillus. A. Sicard and R. Pluvinage.—p. 1800.

Peripancreatic Sympathectomy.—Sendrail and his associates, after directing attention to the possibility of surgical treatment for diabetes, describe their experiments on dogs, which were subjected to peripancreatic sympathectomies. After several alternating perturbations during the first four weeks there was a permanent modification of the glycemic equilibrium, which became manifest in three characteristic aspects: 1. There was a moderate and permanent hypoglycemia. 2. There was an increase in the tolerance for dextrose with amplification of the reactive wave of hypoglycemia. 3. There was a hypersensitivity to insulin. These three characteristics have the same significance in that they indicate that the intervention provoked a persistent elevation of the insulinemia. The authors further describe the anatomic modifications that were elicited by the peripancreatic sympathectomy in the pancreas of the dogs and then discuss the significance of these changes. They admit that these studies were made only on normal animals and direct attention to the difficulties that would be encountered if the same experiments were to be made on animals with induced diabetes. They think that animals with spontaneous diabetes will provide better experimental subjects for this inquiry on the surgical treatment of diabetes.

Meningitis with Friedländer's Pneumonia Bacillus.—According to Sicard and Pluvinage, meningitis with Friedländer's pneumonia bacillus is rare. It is encountered only about once in 100 cases of meningitis. It develops in the course of septicemias with other localizations or complicates an infection of the throat, the nose or the ear. The otitides with pneumobacillus are well known. They are extremely painful and are accompanied by an abundant discharge of a grayish, fetid and viscous pus. Their prognosis is always grave, not only because they are tenacious and relapsing but also because they are complicated by meningitis in about half of the cases. The authors review several cases from the literature in which meningitis developed following an otitis with pneumonia bacilli. They further show that in other cases angina may lead to meningitis

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and they cite a case illustrating this. A comparatively mild angina was followed by a septicemia with signs of meningitis. The patient died and the cerebrospinal fluid was found to be purulent and to contain encapsulated bacilli. Although meningitis as a complication of sinusitis is rare, the authors report a case in which a fistula remained after the surgical treatment of a chronic frontal sinusitis. A meningitis developed and the patient died. The bacteriologic examination revealed the same bacillus in the pus of the frontal sinus, in the cerebrospinal fluid and in the blood. The bacillus had the characteristics of Friedländer's pneumonia bacillus. The authors discuss the clinical aspects of pneumobacillary meningitis. They say that in exceptional cases the onset may be sudden, a veritable ictus, but that at times it is slow. The meningeal signs vary greatly in their intensity. Cutaneous hyperesthesia and disturbances in the sphincters are comparatively frequent. On the other hand, the ocular, motor and vasomotor disturbances and the signs of cortical irritation are comparatively inconstant. Hemorrhagic manifestations are exceptional. The fever is often moderate. The blood culture is nearly always positive. Regarding the prognosis of meningitis with the pneumobacillus, they say that it is grave. When the meningitis follows an infection in the ear or nose, a fatal outcome is the rule. Against the septicemic state, chemical therapeutics in the form of colloidal metals or of the salts of acridine can be used. The authors resorted to ventriculospinal lavage with lukewarm physiologic solution of sodium chloride, to which several drops of methylene blue in a 1:100 solution had been added. This form of lavage was well tolerated in the case under consideration and effected a slight improvement. However, a second lavage was without therapeutic effect; the patient died.

Policlinico, Rome

44: 613-664 (Dec. 15) 1937. Surgical Section

*Goldemberg and Takata-Ara Reactions in Surgical Tuberculosis. G. Agosta.—p. 613.
Lambliasis and Appendicitis. S. Bachi and C. Scartozzi.—p. 622.
Importance of Some Factors in Pathogenesis of Experimental Peptic Ulcer: IV. Chapter on Circulatory Hormone. L. Imperati.—p. 632.
*Preoperative and Postoperative Hydremia. V. Jura.—p. 646.

Goldemberg and Takata-Ara Reactions in Surgical Tuberculosis.—Agosta performed these reactions in thirty-seven patients who were suffering from tuberculosis and in twelve normal persons for control. The reactions give positive results in 51 and 89 per cent, respectively, in surgical tuberculosis. The reactions, especially Goldemberg's, are specific, of diagnostic value and extremely sensitive. Positive results confirm, as a rule, the clinical diagnosis of the disease showing tuberculosis in evolution. They have to be interpreted, however, in association with the results of roentgen and clinical examinations of the patients. They clarify the diagnosis in doubtful cases and may show a tuberculous etiology for several diseases that are not considered tuberculous. It is advisable to resort to the reactions, especially to the deviation of the complement, for an early diagnosis and treatment of the disease.

Preoperative and Postoperative Hydremia. — Jura studied the variations of hydremia in thirty-five patients suffering from abdominal or other diseases and who had been operated on. The highest figures of hydremia before operation were those of patients who had lithiasis of the biliary tract or duodenal ulcer. The group included cases of gastric resection in duodenal ulcer or gastric cancer and those in which operations for biliary calculi, hernia and laparocele and exophthalmic goiter had been performed, and also appendectomy and explorative laparotomy. Immediately after resection of the stomach in duodenal ulcer, chloremia diminished and hydremia increased. Chloremia and hydremia followed the opposite behavior after operations other than gastric resection. During the first few days which followed the operations, hydremia progressively diminished, especially in those cases in which it was high before the operation. As diet and the daily amount of water ingested by the patients returned to normal, hydremia returned to preoperative figures. The quickest return of hydremia to preoperative figures took place in patients who had been operated on for hernia. Hydremia returned to normal more quickly after appendectomy than after cholecystectomy, notwithstanding the fact that the patients in either case take about the same amount of water for the first few days after the operation. Hydremia frequently increases during the first two days which follow gastric resection owing to the action of rectoclysis or phleboclysis. The drinking of water after the second day of the operation does not prevent the lowering of hydremia, which takes place during that time up to the fifth or sixth day, when it again becomes normal. Hydremia and chloremia are closely related. They follow parallel oscillations after surgical interventions on the abdomen, except in the case of gastric resection in duodenal ulcer. The variations of hydremia depend on operative trauma and the postoperative diet. They may be modified by the administration of sodium chloride or dextrose isotonic solutions through preternatural routes. The changes of hydremia depend also on the nature of the organ (stomach or liver) on which the operation is performed.

Riforma Medica, Naples

53: 1653-1688 (Nov. 20) 1937

Crisis of Old Age. G. Monasterio.—p. 1655.
*Bordet-Wassermann Reaction in Blood Serum Freed of Globulin Fraction Precipitated by Hydrochloric Acid. M. Acquaviva Coppola.—p. 1660.
*Anisocytosis of Leukocytes. L. Cona.—p. 1665.

Bordet-Wassermann Reaction in Serum. — Acquaviva Coppola used the Wassermann reaction in about 100 serums, which had been previously deprived of the fraction that is precipitated by hydrochloric acid (Auguste's technic). The technic is the one ordinarily used except for the supplemental preliminary work in eliminating the precipitable fraction of the blood serum. The reaction is more sensitive than the Wassermann reaction (twelve per hundred cases). The specificity is the same for the two reactions. The test is indicated in following the behavior of the blood serum during and after administration of antisyphilitic treatment in cases in which sensitivity is one of the aims. The reaction is not a substitute for the common Wassermann reaction, as the technic is more complicated and delayed than the original one.

Anisocytosis of Leukocytes.—Cona points out the conflicting statements which exist in the literature as to the presence of dwarf and giant forms of polymorphonuclear neutrophils in the blood of patients who have pernicious anemia, septicemia, puerperal infection without blood complications, all the diseases in which there are hyperleukocytosis or leukopenia, myeloid leukemia and postinfectious leukocytosis. According to the author the size of the leukocytes is normal in the mentioned diseases. The presence of macro-anisocytosis and micro-anisocytosis is due to technical errors. The author's statement is based on the study of the blood of patients suffering from those diseases. He made microscopic blood preparations in the following gradations: extremely thin, thin, ordinary, thick, very thick and exceedingly thick. Corresponding to the gradations, he obtained polymorphonuclear neutrophils of 14.94, 13.28, 11.62, 9.96, 8.30, 6.64 and 4.98 microns. Owing to the fact that anisocytosis, when it exists, depends on technical errors, it has neither diagnostic nor prognostic significance as is stated in the literature.

Prensa Médica Argentina, Buenos Aires

24: 2325-2372 (Dec. 8) 1937

Actual Value of Forceps. A. Peralta Ramos.—p. 2325.
*Closure of Cavitation in Course of Hypotensive Artificial Pneumothorax, Especially in Reexpansion of the Lung. F. A. Medici.—p. 2332.
Ultrashort Waves in Treatment of Gynopathies. M. A. Freire.—p. 2338.
Cancer of Breast in Man. A. A. Emanuel.—p. 2356.
Hormone Reactions. D. B. Avila.—p. 2360.
Lactogenic Factors. R. Case and E. Colombo.—p. 2363.

Closure of Tuberculous Cavities.—Medici made an x-ray study of the evolution of tuberculous cavitation in four cases of pulmonary tuberculosis, following the confirmation of a hypotensive artificial pneumothorax. He concludes that tuberculous cavitation may remain open in the course of a hypotensive artificial pneumothorax and close suddenly without any apparent cause or in the course of pleurisy or involuntary reexpansion of the lung. The cavity may close during pneumothorax which has been recently established in the mentioned conditions. The closure of the cavity is due to obstruction of the draining bronchus and disappearance of pericavitary atelectasis and it is permanent. When the pneumothorax is selective and the atelectasis is obstructive, the atelectatic lobe remains retracted during reexpansion of the lung. The normal lobe

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increases in volume and occupies the place that was left by the atelectatic lobe. The mediastinum deviates to the side of the tuberculous lung on disappearance of the cavity. Later the alveoli of the lobe whose bronchi remained opened expand in order to compensate the vacuum, and the mediastinum may return to its normal position. When artificial pneumothorax has been maintained for some time and has induced pericavitary atelectasis but not closure of the cavity, it is advisable to resort to the maneuver for inducing reexpansion of the lung.

Strahlentherapie, Berlin

60: 381-540 (Nov. 10) 1937. Partial Index

*Further Experiences with Radium Chloride Injections. W. Altschul. p. 381.
*Influence of Radium and of Benzene on Blood and Blood Forming Organs with Especial Consideration of Leukocytes. A. Feller.—p. 393.
Practical Results of Reserved Use of Surgical Therapy in Myomas and Preclimacteric Metropathias. C. J. Gauss.—p. 401.
Behavior of Small Pulmonary Cavities in Case of Treatment with Light Baths. A. C. Hissink.—p. 427.
*Question of Atypical Cutaneous Reaction After Roentgen Irradiation. A. Kautzky.—p. 439.
Late Injuries by Roentgen Rays. C. Kruchen.—p. 466.
*Prognosis of Roentgen Therapy of Pulmonary Actinomycosis. B. Kuhlmann.—p. 476.

Experiences with Radium Chloride Injections.—Altschul says that he first reported on the effects of injections of radium chloride in 1932 and that since then he has made further experimental studies. The result of all these experiments induced him to adhere to his original technic. He usually administers two series of six injections. In the first three of each series of six he injects 1 cc. and in the following three 2 cc. Since mild reactions are likely to result at the site of injection, particularly after the injection of 2 cc., the different injections should not be made too close together. A toxic action as the result of cumulation of small doses of radium does not develop with the author's technic. He says that he often treats several joints simultaneously, giving up to three injections at one session. He employs the injections alone or in combination with radium treatment. He obtains especially favorable results in beginning cases of arthritis in the knee and shoulder joints. Cases of rheumatism and neuralgia are likewise benefited by this treatment, as are also arteriosclerotic disorders, such as intermittent claudication; however, in the latter cases the author prefers weak irradiations by means of radium baths combined with irradiation of a segment of the spinal cord or the sympathetic. After giving brief histories of three cases he concludes that, on the basis of his favorable experiences, the injection of radium chloride can be recommended. He thinks that the reason it has not found the place it deserves in the therapeutic armamentarium is that it is not sufficiently known.

Influence of Radium and Benzene on Blood Forming Organs.—The surprising similarity of the impairment of the blood forming system in persons who work with benzene or related substances and in those who come in contact with radioactive substances induced Feller to make experimental studies on rats on the toxic action of these two substances. He found that radium and benzene produce in rats changes in the total number of leukocytes and in the number of the different forms of leukocytes. The changes in the peripheral blood and in the microscopic structure of the organ were similar in the rats that were irradiated and in those that were treated with benzene. However, regeneration was much earlier after treatment with benzene than after treatment with radium. Small differences such as eosinophilia, beginning reduction in the absolute number of the neutrophils, and small fluctuations in the erythrocytes and in the percentage of hemoglobin in the blood of rats treated with benzene seem to indicate that the mode of action is slightly different in the two types of impairment. It has not been determined as yet whether benzene and radium influence the leukocytes directly or by way of the blood forming organs, for the terminal paralysis of the lymphogenic tissues and of the leukopoietic organs could be a primary condition but could also be elicited secondarily by the leukotoxins.

Atypical Cutaneous Reactions After Roentgen Irradiation.—Kautzky reports several cases of atypical reactions after roentgen treatment. In the first case an existing acne, which was slight and had escaped observation, was activated by the roentgen treatment. To be sure, the symptoms of acne were not severe and did not lead to serious sequels. The author further directs attention to the increased reactivity of the skin in hyperthyroidism. He reports the history of a woman with hyperthyroidism who developed a severe urticaria in the course of the roentgen treatment although the applied doses were rather small. The exanthem was comparatively slight on the extremities and on the trunk, but on the irradiated fields it was severe; there was a sharp demarcation of the fields. In another patient, who had been subjected to irradiations of the spleen, pigmentation resulted which was still visible three months later. In a case of malignant struma, which was subjected to fractionated roentgen therapy, the infection of a scratch in the irradiated area resulted in the suppuration of the entire field of irradiation (10 by 10 cm.). A permanent impairment was feared; but two weeks later the entire area had undergone epithelization and the x-ray reaction was subsiding. The author points out that, although these skin reactions usually take a harmless course, they nevertheless introduce a new factor of uncertainty in the already difficult estimation of the biologic reaction.

Prognosis of Roentgen Therapy of Pulmonary Actinomycosis.—Kuhlmann says that the literature reports more failures than successes of the roentgen therapy of pulmonary actinomycosis. He thinks that the failures are chiefly due to the fact that the process is not recognized until it has reached a rather advanced stage. One of the causes of the late diagnosis is that the roentgenologic aspects differ widely. Another factor in the failure of the irradiation of actinomycosis is the dosage. Failure seems to be most frequent in case of intensive irradiation, whereas roentgen treatment with relatively small doses, in combination with potassium iodide, seems to promise favorable results, provided these measures are employed early. The author reports the clinical history of a patient who passed through a severe pulmonary actinomycosis which spread to the hilar and cervical lymph nodes, the pleura and the left posterior spinal roots. There was even a beginning medullary compression. Early roentgen treatment with fractionated and protracted doses in combination with the administration of potassium iodide and gold preparations produced cure, and the patient is still in good health.

Zentralblatt für Gynäkologie, Leipzig

61: 2621-2684 (Nov. 13) 1937. Partial Index

Diagnosis of Tubal Carcinoma. C. Harms.—p. 2628.
Significance of Complement Fixation Reaction, Particularly for Diagnosis of Tuberculosis of Female Genitalia. H. Mittelstrass.—p. 2632.
*Flocculation Number Reaction of Blood Serum According to Takata Dohmoto in Course of Pregnancy, Delivery and Puerperium and in Blood Serum of the New-Born. Y. Charamis.—p. 2638.
Epithelial Metaplasias in Endometritis After Abortion. V. Dubrauszky.—p. 2643.

Flocculation Reaction During Pregnancy.—Various methods have been recommended for the determination of the day of ovulation. Charamis gives attention to the method suggested by Takata and Dohmoto, which expresses the colloidal status of the blood in figures. This method shows that diphasic curves can be observed in the sexually mature woman. A few days after menstruation the curve increases to its highest point, thereupon subsiding to an intermenstrual low point, at which it remains for one day. Then it rises again, to reach a second maximum after from two to three days. Following this second maximum, which does not reach the height of the first one, the curve declines again and reaches its lowest point during the menstruation. Takata and Dohmoto give the following explanation for this behavior of the curve: They assume that, the greater the quantity of hormones in the blood, the lower is the flocculation number. The curve increases after menstruation, because the ovary is in the beginning stage of maturation of the follicle and no hormone circulates in the blood. As the maturation progresses and the quantity of hormone increases, the curve of the flocculation number subsides and reaches its lowest point at the time of complete maturation, for at this time the quantity of follicular hormone has reached its maximum. Observations indicate that this lowest point corresponds to the day of ovulation. After that, with the onset of the phase of luteinization, the flocculation curve increases once more, because the hormone content of the blood decreases at the onset of this phase. As the quantity of hormones increases again, the flocculation curve subsides again. The author studied the reaction on thirty-three pregnant women and found that the values are low until the end of pregnancy nears. Even

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when preeclamptic phenomena developed, the values were low. However, in a woman with hyperemesis gravidarum, in whom the pregnancy had to be interrupted, the flocculation curve increased and this increase continued after the interruption. The author determined the flocculation number in twenty-five cases during the period of labor pains. In these women the values varied, but the figures were usually above those observed at the end of pregnancy. He examined nineteen puerperal women during the first twenty-four hours and seventeen women between the fifth and eighth days after delivery. In one group of cases the reaction showed low values shortly after delivery and a second examination after several days showed the same low values; in another group the values were high shortly after delivery and also several days later; in a third group the values were at first low and later high and in some the reverse was the case. In twenty-five cases the blood of the umbilical cord was examined for the flocculation number and it was found that the values were always lower than in the maternal blood that had been withdrawn during labor pains. Since fluctuations in the flocculation reaction are supposedly dependent on the quantity of hormones, the author discusses the hormone content during the various stages.

Wiener medizinische Wochenschrift, Vienna

87: 1211-1238 (Nov. 20) 1937

Internal Therapy of Diseases of the Stomach. K. Glaessner.—p. 1211.
Rare Case of Gallstone Ileus. W. Goldschmidt and D. Luwisch.—p. 1216.
*Pulmonary Diseases and Suppurations of the Accessory Nasal Sinuses. B. Kecht.—p. 1219.

Pulmonary Diseases and Sinusitis.—According to Kecht, bronchitis is the most frequent pulmonary complication of suppurations of the nasal sinuses. The two disorders may develop simultaneously, for instance in the course of influenza, and if the sinusal suppuration is not promptly cured the bronchitis may become chronic, the sinusal process preventing recovery. Then there are bronchitides, which are elicited and sustained by sinusal disorders. Chronic suppurations of the maxillary sinus are most often responsible. If these are cured, the bronchitis generally disappears at the same time. The author states further that bronchiectases have been observed by some authors in connection with sinusal suppurations. However, among his own patients with sinus disorder there were none with bronchiectasis, and examination of his patients with bronchiectasis failed to reveal sinusal suppurations. He further reports the history of a patient with hemorrhagic pleuropneumonia and suppurating pansinusitis, both of which were cured following a radical operation on the sinuses. Then he reports another case of the concurrence of pneumonia with sinusitis and a case of suppurating pleurisy complicating a sinusitis. The cited cases prove that pulmonary disorders may be the direct result of suppurations of the nasal sinuses. The author emphasizes that, particularly in cases of suppurations of the maxillary sinus with profuse discharge of pus, it should be kept in mind that diseases of the deeper air passages are likely to result: not only bronchitis but even pulmonary gangrene. On the other hand, in case of persistent catarrhal disorders of the deeper air passages the nasal sinuses should be examined for possible pathologic changes. In pulmonary tuberculosis, examination of the sinuses and prompt treatment of existing disorders are advisable, because the bronchial disorders that develop in the course of suppurations of the sinuses exert an unfavorable influence on the pulmonary tuberculosis.

87: 1295-1322 (Dec. 11) 1937

Problem of Cyanosis in Congenital Cardiac Defects of Early Childhood. K. Hochsinger.—p. 1295.
Treatment of Gonorrhea in Both Sexes by Oral Administration of Uliron, a Substance Prepared by G. Domagk. G. Scherber and A. Domes.—p. 1298.
Total Thyroidectomy in Chronic Diseases of Heart and Vessels. F. Mandl.—p. 1300.
*Thrombosis and Auto-Agglutination. E. Weiss.—p. 1303.

Thrombosis and Auto-Agglutination.—Weiss points out that thrombo-embolism has been the object of much discussion in recent years. In view of the fact that Neuda claimed to have found a specific therapy for thrombosis, Weiss decided to study Neuda's theory. He was unable to corroborate Neuda's claim that the predisposition for thrombosis is a result of syphilis, carcinoma and apoplexy. In this connection he cites the fact that in regions where syphilis or carcinoma is frequent thrombosis is a rarity. In taking up the second point of Neuda's theory, namely, that in thrombosis there is regularly a specific immunologic thrombotic reaction the basis of which is the auto-agglutination that is reproduceable in vitro, he shows that the so-called auto-agglutination of Neuda is a pseudo-agglutination and partly even a panagglutination, both frequent and partly even physiologic manifestations. Clinical and experimental investigations demonstrated that there is no pathogenic connection between thrombosis and auto-agglutination of the blood. The author also investigated Neuda's assertion that liver therapy is helpful in the treatment and in the prophylaxis of thrombosis. He tried liver therapy in the treatment of thrombo-embolisms of internal and surgical origin but failed to obtain positive results. In testing the prophylactic effects of liver therapy, he likewise obtained negative results.

Geneeskundig Tijdschr. v. Nederl.-Indie, Batavia

77: 3009-3064 (Nov. 30) 1937

*Convulsion Therapy in Psychoses. P. M. Van Wulfften Palthe.—p. 3010.
*Provision of Prisoners with Vitamin A. A. G. Van Veen, J. C. Lanzing and M. Agoes.—p. 3024.
Amyloid Tumor of the Skin. P. Harahap and S. Mertodidjojo.—p. 3040.

Convulsion Therapy in Psychoses.—Van Wulfften Palthe discusses the symptomatology of schizophrenia and then the various methods of treatment, particularly the convulsion therapy by means of metrazol, which he himself employed in seventeen patients with schizophrenia. In thirteen cases the treatment was completed, and in eleven of these a radical change was noticeable. The patients could be discharged without symptoms. The two other cases, in which the schizophrenia had been most severe, were changed but not improved, even after twenty injections. In four other cases the treatment is not yet completed; the time of observation is as yet too short to permit an evaluation. The author says that the rapidity with which the symptoms disappear is surprising and that the manner in which the improvement takes place is different from anything that is ordinarily observed in these cases. Nevertheless the treatment still has some unsatisfactory aspects. To be sure, outside of a luxation of the jaw and a fracture of an arm there were no harmful sequels in 124 induced convulsions, but it has not yet been proved that the brain tissue is not impaired by the convulsions. Moreover, the mode of action is still unknown. The author is of the opinion that the convulsion therapy remains a "heroic" measure.

Provision with Vitamin A.—Van Veen and his associates describe studies on the vitamin A content of the blood serum of some native prisoners in Batavia. Despite the fact that these native prisoners take in practically no vitamin A proper with their food, the average vitamin A content of their serum does not differ greatly from that of Europeans and others in Batavia, whose daily food does contain this vitamin in abundant quantities. A chromatographic method enabled the authors to analyze the serum carotinoids qualitatively and quantitatively and to calculate the amount of provitamin A. Their studies revealed that the vitamin A content of the serum of the native prisoners is derived from the A provitamins, which are contained in their food in large quantities.

Ugeskrift for Læger, Copenhagen

99: 1249-1276 (Nov. 25) 1937

Lupus Erythematosus Provoked by Light Treatment: Two Cases. H. Haxthausen.—p. 1249.
*Finsen Treatment of Lupus Vulgaris of Skin: After-Examination of Three Hundred and Ten Patients in Jylland. S. Lomholt.—p. 1250.
Treatment of Sarcoid of Boeck in Mucous Membrane. K. Barmwater. —p. 1255.
Electrocoagulation Treatment of Cavernous Hemangioma. E. Dujardin. —p. 1257.

Finsen Treatment of Lupus Vulgaris of Skin.—According to Lomholt's experience, centralization of the Finsen treatment of this disease with the direction in the hands of fully trained specialists in the various fields of the treatment is called for. He emphasizes the excellent results attained both curatively and cosmetically under these conditions. He stresses that the chance of successful results is lessened when other forms of treatment have preceded, and that cure can hardly be expected in cases in which eruptions have been neglected for from ten to forty years.